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THE MINERAL INDUSTRY of PENNSYLVANIA in 1958

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The Mineral Industry of Pennsylvania

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By Robert D. Thomson,[1] Mary E. Otte,[2] and Robert E. Ela[3]

PENNSYLVANIA'S mineral output in 1958 was characterized by decreased and limited markets due to a widespread drop in State as well as national economy. The index of general business in Pennsylvania was 166 (1947–49=100) 7 points lower than 1957, while the index of industrial activity dropped to the lowest point since 1945, being 9 points under the peak years 1956 and 1957. Two major factors that affected 1958 mineral production, in addition to a business recession, were extremely adverse weather conditions during the first quarter, which created a slowdown in construction work, and the im-

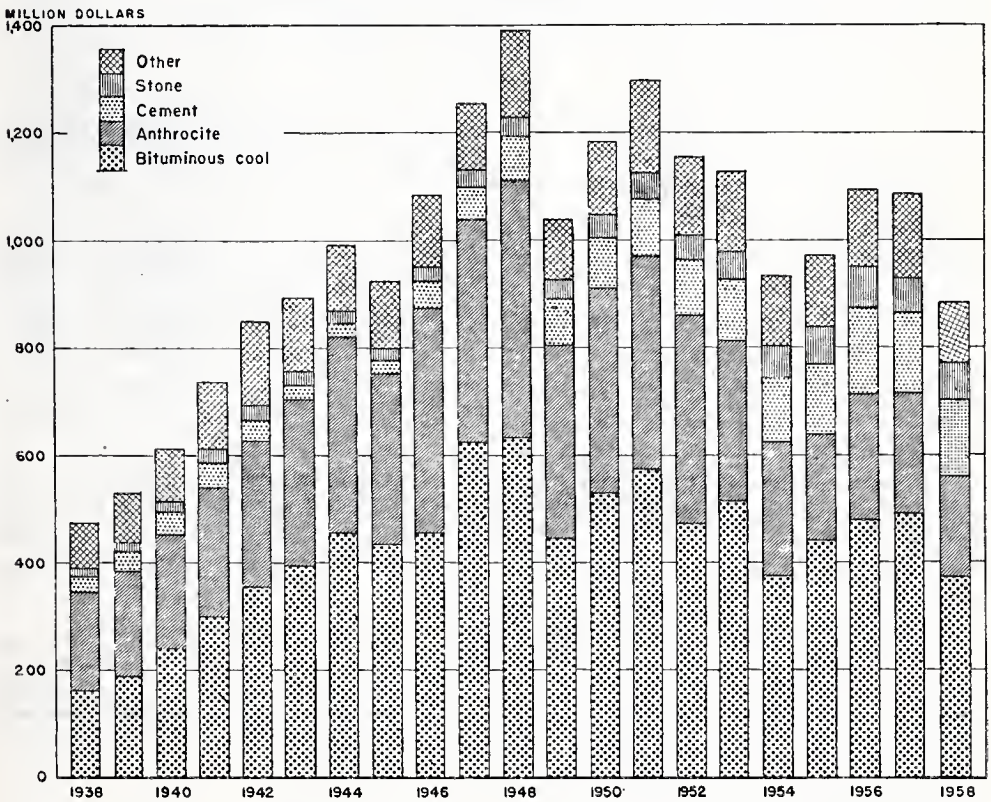

FIGURE 1.—Value of bituminous coal, anthracite, cement, and stone and total value of mineral production in Pennsylvania, 1938–58.

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pact of continuing inflation. Reflecting the adverse 1958 economy, all major mineral industries declined in value of output. The production of bituminous coal, clays, iron ore, and stone was affected by a drop in steel production; cement, clays, sand and gravel, and stone by a decline in construction. Delays in the Federal highway programs were reflected in lower outputs of nonmetals.

Significant developments in mining were the shipments of metallic ore from two new mines. One mine in Lehigh County revived zinc production, last reported in 1876, and the other (Berks County) became the second active iron-ore mine in the State.

Employment and Injuries.—Injury experience in the selected nonmetallic mineral industries shown in table 2 was much better than in 1957. No fatalities were reported, compared with 8 for 1957, and nonfatal injuries decreased from 498 to 481. The granite industry had the lowest frequency rate, reporting no injuries for a total of 20,048 man-hours. The cement industry was the second-ranking industry in injury rates—1.96 per million man-hours.

The bituminous coal industry had a better safety record than in 1957, having only 32 fatalities, 22 less than in 1957. The number of fatalities per million short tons was 0.47 compared with 0.63 in 1957.

TABLE 1.—Mineral production in Pennsylvania [1]

Mineral	1957		1958	
	Short tons (unless otherwise stated)	Value (thousands)	Short tons (unless otherwise stated)	Value (thousands)
Cement:				
Portland, 376-pound barrels	42,519,334	$140,100	40,147,578	$135,118
Masonry, do	2,161,109	8,030	1,967,517	7,281
Clays	4,073,666	22,012	[2] 3,317,600	[2] 17,051
Coal:				
Anthracite	25,338,321	227,754	21,171,142	187,898
Bituminous	85,365,254	492,539	67,770,862	373,812
Cobalt (content of ore), pounds	599,122	[3]	564,382	[3]
Gem stones	[4]	[5]	[4]	2
Iron oxide pigments (crude)	998	9	1,154	10
Lime	1,298,401	18,406	1,003,058	12,457
Natural gas, million cubic feet	101,801	31,660	95,869	27,131
Natural-gas liquids:				
Natural gasoline, thousand gallons	3,106	192	1,608	107
LP-gases, do	1,211	106	1,363	123
Peat	26,086	236	23,623	203
Petroleum (crude), thousand 42-gallon barrels	8,179	38,687	[6] 6,678	[6] 27,380
Sand and gravel	12,405,654	19,570	11,825,024	19,180
Slate	139,283	4,005	(7)	(7)
Stone	43,257,558	73,090	40,049,162	69,694
Zinc [8]	----------	----------	10,812	2,229
Value of items that cannot be disclosed: Copper, gold, iron ore, mica, pyrites, sericite schist, silver, soapstone, tripoli, and values indicated by footnote [3]	----------	[9] 16,604	----------	15,950
Total Pennsylvania [10]	----------	[9] 1,077,157	----------	881,181

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producer).
[2] Excludes kaolin; value included with "Items that cannot be disclosed."
[3] Figure withheld to avoid disclosing individual company confidential data.
[4] Weight not recorded.
[5] Less than $500.
[6] Preliminary figure.
[7] Included with stone.
[8] Recoverable zinc valued at the yearly average price of Prime Western slab zinc, East St. Louis market. Represents value established after transportation, smelting, and manufacturing charges have been added to the value of ore at mine.
[9] Revised figure.
[10] Total adjusted to eliminate duplicating value of clays and stone in manufacturing lime and cement.

Of the underground fatalities, 16 were from falls of roof, 7 from haulage, 2 from explosives and machinery, and 1 from electricity. Fatalities for surface and strip operations were two from machinery and two from miscellaneous causes. Nonfatal injuries (1,535) also decreased by 525. The number of injuries per million man-hours was 0.53 for fatal and 25.47 for nonfatal injuries, compared with 0.66 and 25.16 for 1957, respectively. The number of injuries per million short tons was 0.47 for fatal injuries and 22.57 for nonfatal injuries, compared with 1957 rates of 0.63 and 23.87, respectively.

The fatality experience for the anthracite industry was somewhat better than in 1957, with deaths reported 37 percent lower in number and occurring 17 percent less frequently. Twenty-six of the 32 fatalities reported by the anthracite industry occurred underground, 3 at surface operations, and 3 at stripping operations. In 1958, 19 of the 26 underground fatalities resulted from falls of roof, face, or rib; and in 1957, 30 of the 49 underground fatalities resulted from the same cause: The number of injuries per million man-hours of exposure was 59.88, compared with a rate of 61.93 in 1957.

The Germantown Colliery, Raven Run Coal Co., Centralia, Pa., operating in Columbia, Schuylkill, and Northumberland Counties, was the winner of the National Safety Competition for anthracite mines.

Consumption, Trade, and Markets.—Most of the mineral commodities produced in Pennsylvania were consumed within the State. Bituminous coal (the State's foremost mineral) was consumed locally for coke production and other industrial uses, for residential fuel, and for electric power generation. Most of the anthracite was shipped out of the producing region. The other mineral fuels produced in Pennsylvania found ready markets within the State.

Although Pennsylvania ranks high as a coke producer, some coking coal was shipped into the State for consumption by the steel industry. The steel industry relied on shipments of iron ore from other States and foreign deposits and depended on imports for all of its ferroalloys.

Basically the nonmetallic minerals in Pennsylvania were consumed within the State. There were a few exceptions to this trend. Cement

TABLE 2.—Employment and injuries for selected mineral industries in 1958

Commodity	Average number of men working	Total man-hours	Total number of lost-time injuries		Number of injuries per million man-hours
			Fatal	Nonfatal	
Anthracite	22,400	33,480,000	32	2,124	59.88
Basalt	541	1,189,565	----	17	14.29
Bituminous coal	40,200	60,270,000	32	1,535	25.47
Cement [1]	4,266	10,738,796	----	21	1.96
Clays	2,764	5,002,151	----	168	33.59
Granite	11	20,048	----	----	0
Lime [1]	1,389	3,058,212	----	32	10.46
Limestone [2]	2,688	4,943,875	----	130	26.95
Miscellaneous stone	35	57,434	----	4	69.65
Sand and gravel	1,484	2,759,673	----	40	14.49
Sandstone	495	738,485	----	30	40.62
Slate	626	1,326,006	----	39	29.41

[1] Includes quarries or pits producing raw material used in manufacturing cement or lime for captive operations.

[2] Excludes quarries or pits producing limestone used exclusively in manufacturing cement or lime.

was shipped to 38 States and the District of Columbia, the major portion being shipped to the Northeastern States. Most of the lime was consumed in the State, but large quantities were shipped to bordering States. Clay production in Pennsylvania was primarily captive tonnage for use in manufacturing refractories and heavy clay products. These products were consumed in the State as well as bordering States.

Other metallic materials and ores were shipped into the State for processing into semifinished or fully fabricated products, such as aluminum, beryllium, lead, and molybdenum.

Trends and Developments.—Important among the new plants constructed or in process of construction was completion of a fabricating plant by Beryllium Corporation at Ashmore. This was reported to be the first integrated, privately owned plant in the United States for fabricating beryllium metal. Pittsburgh Coke & Chemical Co., Neville Island, Pittsburgh, completed rebuilding and adapting of an existing blast furnace for producing ferromanganese. The total cost of the changeover was about $2.5 million, giving a blast furnace with a capacity of 400 tons a day of high-carbon ferromanganese, 600 tons a day of spiegeleisen, or 900 tons a day of pig iron. Jones & Laughlin Steel Corp. announced construction of a new iron-ore sintering plant and ore-screening facilities at its Aliquippa works. Universal Cyclops Steel Corp. began constructing a $4 million plant at Bridgeville for manufacturing high-temperature metals to be used in jet missiles and rockets. The New Jersey Zinc Co. added new equipment to its smelter at Palmerton, achieving greater efficiency in the firm's system of producing zinc oxide.

The new American Cyanamid Co. ammonium nitrate manufacturing plant in New Castle began continuous production in September, marking completion of the company industrial rebuilding expansion program, begun in 1957.

The Glen Alden Coal Co. put into operation a new $1 million steel-frame, aluminum-sheeted breaker at Audenried. The plant was designed to handle 250,000 tons annually of all sizes of coal.

Keystone Division of Dravo Corp. began constructing a new sand and gravel dredge. The dredge, to be completed by 1960 and costing $2 million, will have a capacity of 500 tons of material an hour and will replace its 30-year-old predecessor.

The cement and lime industries were characterized by plant improvements and modernization of older plants. Certain plants had extensive programs for dust control. The refractories industry was active in plant improvements and in the development of new products, particularly refractories for high-temperature ranges. The structural clay industry developed new outlets for its products through application of research.

Legislation and Government Program.—Eighteen projects under the joint Federal-State program for controlling mine water in the anthracite region, with an aggregate cost (contracted or estimated) of nearly $6.75 million, were in an active status or had been completed by the close of 1958. During 1958 five projects, totaling nearly $2.5 million, were approved for Federal participation.

Nine of the active or completed projects required large-capacity vertical, turbine-type pumps to control the level of water pools in abandoned underground workings, as well as to prevent the flooding

of anthracite reserves and protect adjacent mines. The 25 pumps required for these projects had a total capacity of 119,000 gallons of water a minute. The remaining nine projects dealt principally with improving surface drainage, such as by backfilling old strip pits and constructing ditches and flumes designed to prevent water from seeping into underlying mine workings. Of the seven projects completed in 1957–58, one of the installations comprised two pumps for the total capacity of 10,000 gallons a minute, while the other six were surface-drainage improvements. These improvements are estimated to prevent more than 1 billion gallons of water from entering the anthracite mines annually.

REVIEW BY MINERAL COMMODITIES

MINERAL FUELS

Anthracite.—The downward trend in anthracite output was accelerated in 1958. The drop resulted from a combination of adverse factors, including a 2-million-ton drop in exports, lower domestic business activity, and continued losses to competitive fuels. All major United States markets showed losses; however, total apparent consumption fell only 9 percent as the effect of competitive losses to other fuels was partly minimized by increased demand for space-heating fuels because of unusually cold weather in January through March.

Production was 21.2 million short tons—a 16-percent decline from 1957—and was valued at $187.9 million, an 18-percent decrease. The average price a ton at preparation plants fell from $8.99 a ton in 1957 to $8.88 in 1958. Production from underground mines represented 51 percent of the total anthracite production (1 percent greater than in 1957), and output from strip pits represented 32 percent—approximately 2 percent greater than in 1957. The remaining production came from culm banks and river dredging.

More of the coal produced underground was loaded by hand than in 1957. Fifty percent of the underground production was mechanically loaded, compared with 53 percent in 1957. In all, 290 scraper loaders (5 less than in 1957), 51 mobile loaders (15 less than 1957), and 1,234 conveyors and pit-car loaders (203 less than in 1957) were used to load coal mechanically underground.

Production from strip mines totaled 6.9 million tons, 179 power shovels and 245 draglines being used in stripping Pennsylvania anthracite and in the recovery of culm banks. Of the total, 31 were driven by gasoline, 95 by electric, and 298 by diesel.

Production from culm banks totaled 2.9 million tons and by dredge 692,000 tons. Of the total production by dredges, 94 percent came from the Susquehanna River and 4 percent from the Lehigh River. Value a ton for dredged anthracite was $1.92—18 cents more than in 1957. Production from culm banks came from the Lehigh, Schuylkill, and Wyoming regions and Sullivan County.

Apparent consumption continued to decrease, totaling 19 million tons, a 9-percent decrease compared with 1957. Slightly over 16 million tons of anthracite was shipped out of the producing areas (23 percent less than was shipped out in 1957), whereas 4.8 million tons was sold to local trade (an increase of 19 percent), and 195,000

tons was used as colliery fuel (a decline of 30 percent). According to the Pennsylvania Department of Mines, 11 million tons of anthracite was shipped by rail, 76 percent of which went to the New England States, New York, New Jersey, and Pennsylvania. Truck shipments totaling 9 million tons went primarily to the eastern coast; the majority was destined to Pennsylvania consumers. Average values for Pennsylvania anthracite were $9.02 a ton for that shipped outside the producing regions, $8.51 for local sales, and $6.33 for colliery fuel.

The average number of days worked was 13 less than in 1957, totaling 183. The average number of men working totaled 26,540, with an output a day of 4.36 net tons and per man per year of 798 tons. These output rates compare with 4.18 and 819 for 1957.

Schuylkill County was the leading county in the production of anthracite in Pennsylvania, totaling 7.9 million tons. Luzerne County was the second-ranking county, with a production of 6.8 million tons. Other counties producing anthracite (in order of decreasing tonnage) were Northumberland, Lackawanna, Columbia, Lancaster, Carbon, Dauphin, Snyder, Wayne, Sullivan, Lebanan, and Susquehanna. Producers in Schuylkill and Luzerne Counties supplied 70 percent of the total tonnage (66 percent in 1957) and 73 percent of the total value (68 percent in 1957).

Bituminous Coal.—Bituminous coal output was 21 percent (17.6 million tons) less than in 1957 and the lowest since 1898. Bituminous coal production remained the principal mineral industry in Pennsylvania, although the coal index of production dropped to 55 (1947–49=100) from 70 in 1957 and 72 in 1956. The unit value of output also decreased averaging $5.52 per ton—25 cents lower than in 1957.

In 1958, 1,412 mines producing 1,000 tons or more were active—187 less than in 1957. The number of active underground mines decreased from 893 to 809, strip mines from 663 to 565, and auger mines from 43 to 38.

Approximately 71 percent of the total bituminous output came from underground mines; this was 4 percent or 16 million tons less than was mined in 1957 by underground methods. Of the total underground output, 98 percent was cut by machine, including 46 percent mined by continuous miners; the remainder was cut by hand or shot from the solid—1958 showed an increase of 13 percent in the use of continuous miners underground. In all, 1,447 cutting machines and 303 continuous miners were used. Locomotives (2,343), animals (2,201), mother conveyors (1,925), shuttle cars (1,155), and rope hoists (701) were used for underground haulage. Pennsylvania underground production was characterized by highly mechanized operations, with 93 percent of the underground production mechanically loaded through the use of 1,382 machines. Mobile loaders were the primary moving device, loading into shuttle cars a total of 14,419,000 tons, into mining cars 3,312,000 tons, and onto conveyor belts 2,161,000 tons. Handheld and post-mounted drills as well as mobile drills were used underground; 18.7 million tons of coal was drilled, using 1,367 handheld or post-mounted drills, and 5.2 million tons of coal was drilled with 146 mobile drills. A total of 282 rotary and 545 percussion roof or rock drills was used. Bituminous coal produced from underground mines was shipped primarily by rail (87 percent) and truck (8 percent). Captive markets dominated,

only 46 percent of the total underground output being sold on the open market. The average value of underground output totaled $6.21, with an average value of $5.69 for coal sold on the open market.

Pennsylvania strip mining continued to decrease, dropping 7 percent to the lowest output since 1954. Most of the strip coal (62 percent) was shipped by rail for sale on the open market. A total of 1,919 trucks or trailer tractors was active, having an average capacity of 11 tons per unit. Truck shipment to consumers totaled 7.4 million tons, representing 38 percent of the strip-mine output. The average value a ton of strip-mine coal was $3.86, 24 cents lower than in 1957. Open-market coal was valued at $3.82 and captive coal at $4.92.

Bituminous coal was stripped and loaded, using electric, diesel-electric, diesel, and gasoline power shovels and draglines. Of the 968 power shovels in use, 903 had a capacity of less than 3 cubic yards, 60 of 3 to 5 cubic yards, 2 of 6 to 12 cubic yards, and 3 over 12 cubic yards. Draglines totaled 377—6 less than in 1957—of which 154 had a capacity of less than 3 cubic yards, 140 of 3 to 5 cubic yards, 77 of 6 to 12 cubic yards, and 6 over 12 cubic yards. A total of 24 carryall scrapers was used; 14 had a capacity of over 12 cubic yards, 5 of 6 to 12 cubic yards, 4 of less than 3 cubic yards, and 1 of 3 to 5 cubic yards. Also used were 833 bulldozers, 143 horizontal power drills, and 118 vertical power drills.

There were 38 auger mines, 5 less than in 1957. Over 60 percent of the auger-mine production was shipped by rail to the open market. Auger coal was sold at an average value of $3.12. A total of 38

TABLE 3.—Bituminous-coal production, by types of mining and counties, 1958

County	Underground		Strip		Auger	
	Number of mines	Short tons	Number of mines	Short tons	Number of mines	Short tons
Allegheny	32	4,555,141	25	423,625		
Armstrong	56	1,164,058	37	1,125,232	6	44,837
Beaver	3	25,336	13	197,325	1	6,161
Bedford	28	127,470	(1)	(1)		
Blair	3	18,619	(1)	(1)	1	4,399
Bradford			(1)	(1)		
Butler	31	258,722	38	1,607,569	(1)	(1)
Cambria	109	7,815,378	20	364,175	2	4,974
Cameron			(1)	(1)		
Centre	17	60,898	19	872,539	2	13,760
Clarion	16	78,779	29	2,664,479		
Clearfield	89	1,311,172	109	4,194,252	7	38,412
Clinton	4	14,892	7	599,143		
Elk	16	156,256	8	169,978	3	43,606
Fayette	35	2,563,959	30	295,564	1	3,942
Greene	22	9,733,221	3	13,504		
Huntingdon	7	15,637	4	29,665		
Indiana	84	4,756,431	30	944,850	5	31,849
Jefferson	39	468,222	30	901,745	3	26,821
Lawrence	(1)	(1)	24	1,043,989		
Lycoming	(1)	(1)	2	45,398		
McKean			3	47,432		
Mercer	3	45,119	8	582,428		
Somerset	115	1,612,551	59	1,185,085	3	16,248
Tioga	5	29,117	3	265,149		
Venango			14	621,285		
Washington	24	9,495,225	25	1,202,723	1	15,300
Westmoreland	66	3,459,225	17	138,893	(1)	(1)
Undistributed	5	24,420	8	179,817	3	14,861
Total	809	47,789,848	565	19,715,844	38	265,170

[1] Figure withheld to avoid disclosing individual company confidential data; included with "Undistributed."

augers was used during the year, plus 2 bulldozers and 5 each of horizontal and vertical power drills.

Ninety-three preparation plants compared with 98 for 1957 were operated. These plants produced 38.2 million tons of clean coal, 92 percent of which came from underground mines and 8 percent from strip mines. Of the total production mechanically cleaned, 87 percent was wet-washed (29 percent by jigs and 71 percent by other wet methods), and 13 percent was cleaned by pneumatic methods. Pneumatic cleaning gave the better recovery, 90 percent of the raw coal being recovered compared with 76 for jigs and 78 for other than wet jigs or other wet methods.

At the mines having crushing facilities, 30.1 million tons was crushed, representing 65 percent of the tonnage produced at these mines. The total output of mines having treatment facilities equaled 22 million tons. Of this total, 6.1 million tons was treated—852,000 tons was treated with calcium chloride, 3.9 million with oil, 267,000 with both calcium chloride and oil, and 1 million with all other materials.

Coke and Coal Chemicals.—Pennsylvania ranked first in tonnage and value for both beehive and oven coke produced in the United States, despite a 34-percent decrease in production in 1958. Declines of 30 percent in production of oven coke and 78 percent for beehive coke were due primarily to a lower operating rate of blast furnaces and a large reduction in demand for foundry coke for automobile production. In addition, the steel industry made substantial improvement in fuel efficiencies at blast furnaces. Fourteen coke plants operating 4,168 slot-type ovens (99 more than were operated in 1957) carbonized 20.3 million short tons of coal to produce 14 million tons of oven coke, a 69-percent yield of coke from coal. A total of 581,000 tons of coal was carbonized in 7,316 beehive ovens (720 less than in 1957) to produce 355,000 tons of coke. The average value for oven coke at the ovens was $16.92 a ton, compared with $13.46 for beehive coke—a decrease of 19 cents and 96 cents, respectively, from 1957. Of the oven coke produced in Pennsylvania, 95 percent was used by producers, 99 percent of which was used in blast furnaces. Commercial shipments went to blast furnaces, foundries, and other industrial plants and for residential heating. Blast furnaces consumed 44 percent, other industries 29 percent, and foundries 20 percent of the total oven coke marketed. Of the total sales of beehive coke, 63 percent was used by blast furnaces, 33 percent by other industries, and 4 percent by foundries. A total of 787,000 tons of coke breeze was recovered at coke plants in Pennsylvania. Producers reported using 578,000 tons for steam raising, 64,000 for sintering iron ore, and 52,000 for other industrial uses. Sales of coke breeze from Pennsylvania plants totaled 76,000 net tons at an average value of $5.33.

Coal produced in Kentucky, West Virginia, Virginia, and Pennsylvania was used in oven-coke plants in Pennsylvania. The major portion (66 percent) came from mines in Pennsylvania. Of this coal, 78 percent was high volatile, 10 percent medium volatile, and 12 percent low volatile.

Of the 209 billion cubic feet of coke-oven gas produced in Pennsylvania, 39 percent was used in heating ovens, 60 percent was surplus

used or sold, and 1 percent was wasted. Eighty-three percent of the surplus coke-oven gas was used by producers in steel or allied plants and 12 percent under boilers; 5 percent was distributed through city mains. Thirteen plants produced coke-oven ammonia having a yield of 420 million pounds of sulfate equivalent. A total of 207 million gallons of coke-oven tar was produced by companies in Pennsylvania, of which producers used 132 million gallons for refining or topping, and 34 million gallons as fuel and 45 million gallons was sold for refining into tar products. Fourteen plants produced 63 million gallons of crude light oil. Plants in Pennsylvania also produced benzene (32 million gallons), toluene (8.6 million gallons), xylene (3 million gallons), and solvent naphtha (1.9 million gallons).

TABLE 4.—Annual capacity of coke ovens owned by iron and steel companies on January 1, 1959, in short tons [1]

Company	Plant location	Beehive		Other		Total annual capacity
		Number of ovens	Annual capacity	Number of ovens	Annual capacity	
	Allegheny County:					
United States Steel Corp. (central operations).	Clairton			1,567	7,833,800	7,833,800
Pittsburgh Coke & Chemical Co.	Neville Island			140	1,000,000	1,000,000
Jones & Laughlin Steel Corp	Pittsburgh			379	1,200,000	1,200,000
	Beaver County:					
Jones & Laughlin Steel Corp	Aliquippa			352	2,062,000	2,062,000
Crucible Steel Co. of America	Midland			213	790,000	790,000
United States Steel Corp. (central operations).	Bucks County: Fairless Hills.			174	952,100	952,100
Bethlehem Steel Co	Cambria County: Johnstown.			316	1,836,000	1,836,000
Bethlehem Steel Co	Dauphin County: Steelton.			130	768,000	768,000
Interlake Iron Corp	Erie County: Erie			58	267,000	267,000
Republic Steel Corp	Fayette County: Brownsville Junction.	296	215,000			215,000
Alan Wood Steel Co	Montgomery County: Swedeland.			151	600,000	600,000
Bethlehem Steel Co	Northampton County: Bethlehem.			496	2,136,000	2,136,000
	Westmoreland County:					
Carpentertown Coal & Coke Co.	Mount Pleasant	277	160,000			160,000
Pittsburgh Steel Co	Monessen	320	228,000	93	600,000	828,000
United States Steel Corp. (central operations).		1,147	687,500			687,500

[1] American Iron and Steel Institute.

Peat.—Pennsylvania ranked fifth among the twenty-one peat-producing States. Production and value of output of humus and reed-sedge decreased 9 and 14 percent, respectively, compared with 1957. Producers were active in Luzerne, Mercer, Erie, and Lawrence Counties, in order of importance.

Petroleum and Natural Gas.—Crude-petroleum output decreased 18 percent in quantity and 29 percent in value, continuing a long-term downward trend. The value of crude petroleum was $4.10, 63 cents less than that reported for 1957. Among the States, Pennsylvania ranked 19th as a crude-petroleum producer. Quarterly production totaled 1,687,000 barrels for the first quarter, 1,754,000 for the second quarter, 1,695,000 for the third quarter, and 1,542,000 for the fourth quarter. January was the month with the largest production, total-

ing 615,000 barrels, the lowest production (482,000 barrels), being reported in November. The Bradford-Allegheny field, lying in Pennsylvania and New York, ranked 41st in leading fields in 1958. Production from this field totaled 6,459,000 barrels, bringing production since discovery to 683 million barrels.

Pennsylvania ranked 10th in natural gas production and eighth in total dollars, showing a decrease in both quantity and value compared with 1957.

The number of wells completed in Pennsylvania continued to decline, dropping to a total of 652. Of this total, 193 were oil wells, 281 gas wells, 81 dry holes, and 97 service wells. Wildcat wells completed totalled 26—the largest number since 1954. Of this total, 9 were in new gas pools, 16 in dry holes, and 1 in crude oil. Completed field wells dropped from 815 in 1957 to 626 (192 oil wells, 272 gas wells, 65 dry holes, and 97 service wells). The footage for completed wells totaled 1,963,000 with an average footage of 3,011—a decline from 3,190 for the previous year. Footage for completed wildcat wells totalled 1,556,000 and for field wells 1,807,000. Ninety-seven percent of all wells drilled were put down with cable tools and the remainder by rotary.

The proved recoverable crude-oil reserve in Pennsylvania was estimated at 120 million barrels as of December 31, 1958—6 million barrels less than was reported in 1957. This represented 0.36 percent of the U. S. total reserve. The proved recoverable reserve of natural gas in Pennsylvania was 870,000 million cubic feet as of December 31, 1958, 16,000 million more than on December 31, 1957. Of the natural gas reserves, 487 billion cubic feet was nonassociated reserves, 27 billion was dissolved, and 356,000 million was held in underground reservoirs for storage purposes.

Natural-Gas Liquids.—Natural-gas liquids (natural gasoline, and liquefied-petroleum gas) were produced in Pennsylvania in 1958. Output of natural gasoline decreased and LP-gases increased in 1958, having an average value per thousand gallons of $66.54 and $90.24. Reserves of natural-gas liquids as of December 31, 1958, were estimated at 3.7 million barrels—200,000 barrels more than was reported at the end of 1957.

Refineries.—Thirteen petroleum refineries were active.

TABLE 5.—Capacity of petroleum refineries, January 1, 1959

Company	Location	County	Type of plant	Crude-oil capacity [1]		Production-barrels per stream day [1]			
				Barrels per calendar day	Barrels per stream day	Alkylation	Polymerization	Lubes	Asphalt
East:									
Atlantic Refining Co	Philadelphia	Philadelphia	Comp	148,000	156,000	[2] 5,400	[2] 1,700	[2] 5,000	[2] 7,500
Gulf Oil Corp	Girard Point	do	S-C-L	182,000	192,000	6,800	3,600		
Sinclair Refining Co	Marcus Hook	Delaware	S-C	133,000	140,000		1,850		
Sun Oil Co	do	do	Comp	160,000	[3]	[2] 7,000		[2] 11,800	[2] 800
West:									
Franklin Refinery Division of L. Sonneborn Sons, Inc.	Franklin	Venango	S-L	2,000	2,000			500	
Kendall Refining Co	Bradford	McKean	Comp	4,800	5,200			1,200	
Pennsylvania Refining Co	Karns City	Butler	S-L	1,300	1,500			325	
Pennzoil Division of South Penn Oil Co	Rouseville	Venango	Comp	10,000	10,400		380	2,500	
Quaker State Oil Refining Corp	Emlenton	do	do	2,540	3,000		75	1,700	
Do	Farmers Valley	McKean	do	3,810	4,500		100	2,300	
United Refining Co	Warren	Warren	do	15,000	15,600		375		1,500
Valvoline Oil Co. Division of Ashland Oil & Refining Co.	Freedom	Beaver	S-L	5,500	6,000			800	
Wolf's Head Oil Refining Co., Inc	Reno	Venango	Comp	2,500	2,600			750	
Total				670,450	706,800	20,600	8,280	28,675	10,700

[1] Oil and Gas Journal, vol. 57, No. 14, Mar. 30, 1959, p. 130.
[2] Barrels per calendar day.
[3] Not reported.

Cement.—Adverse weather conditions hampered construction and resulted in a substantial drop in cement shipments during the first quarter of 1958. Gradual improvement in housing starts and in general business activity increased shipments in the second and third quarters, but the total output did not reach the 1957 level.

The capacity of the 24 plants totaled 56 million barrels—67 percent by the dry process and 33 percent by the wet process. The industry consumed 983 million kw.-hr. of electrical energy, of which 652 million was purchased from public utility companies. Stocks of portland cement on hand in the beginning of the year totaled 5 million barrels, while stocks at the end of the year totaled 5.6 million barrels.

Portland cement was shipped to 38 States and the District of Columbia; 24 percent went to New York, 21 percent to New Jersey, 6 percent to Connecticut, 5 percent to Ohio, and 3 percent to Maryland; 33 percent of the shipments was consumed in Pennsylvania.

Masonry-cement shipments, chiefly from Lehigh and Northampton Counties, decreased much as did portland-cement shipments. Masonry cement was shipped to 23 States, of which 39 percent was consumed in Pennsylvania, 18 percent in New Jersey, 14 percent in New York, and 11 percent in New Hampshire.

The principal raw materials used for manufacturing portland cement were cement rock and limestone. Totals of 8.9 million short tons of cement rock and 2.8 million tons of limestone were used. In addition, the following tonnages of raw materials were used: Gypsum 301,000, sand 169,000, slag 154,000, clay 232,000, and iron material 66,000. Quantities of slate, flue dust, carbon black, flint rock, and air-entraining compounds also were used.

TABLE 6.—Shipments of portland cement by counties

County	Number of plants in 1958	1957		1958	
		Short tons	Value	Short tons	Value
Lehigh	5	7,239,300	$23,585,408	6,599,198	$21,769,945
Northampton	11	20,616,513	67,448,502	19,957,871	66,432,924
Allegheny	2	[1] 9,492,915	[1] 31,061,528	[2] 7,128,370	[2] 24,317,578
Lawrence	2				
Butler	1				
Berks	1	[1] 5,170,606	[1] 18,004,400	[2] 6,462,139	[2] 22,597,610
Montgomery	1				
York	1				
Total	24	42,519,334	140,099,838	40,147,578	135,118,057

[1] Allegheny, Lawrence, and Butler Counties and Berks, Montgomery, and York Counties combined for 1957 to avoid disclosing individual company confidential data.
[2] Allegheny and Lawrence Counties and Butler, Berks, Montgomery, and York Counties combined for 1958 to avoid disclosing individual company confidential data.

Clays.—A sharp drop in the activities of the refractory-consuming industries and the construction industry caused an 18-percent decrease in the output of clay in Pennsylvania. The production of fire clay dropped 26 percent to the lowest annual rate of production since 1947. This decline was due to a 36-percent drop in the demand for refractory materials by the steel, glass, and foundry industries and a 12-percent decline in the production of heavy clay products.

TABLE 7.—Clays sold or used by producers, by kinds and uses, in short tons

Uses	Fire clay		Miscellaneous clay		Kaolin	
	1957	1958	1957	1958	1957	1958
Refractories:						
Bauxite, high-alumina brick	(1)	4,000				
Firebrick and block	931,680	598,320			9,078	(2)
Fire-clay mortar	(1)	12,516				
Clay crucibles		8,669				
Foundries and steelworks	94,815	65,794	(1)	(1)		
Heavy clay products	896,076	773,295	1,590,363	1,414,282		
Lightweight aggregate	(1)		126,360	103,740		
Paint filler or extenders			219			
Cement			201,250	232,120	26,555	(2)
Undistributed	[3] 168,731	[3] 81,681	[4] 28,539	[4] 23,183		
Total	2,091,302	1,544,275	1,946,731	1,773,325	35,633	(2)

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Figure withheld to avoid disclosing individual company confidential data.
[3] Includes art pottery and stoneware, glass and miscellaneous refractories, and items indicated by footnote 1.
[4] Includes art pottery and stoneware, foundries and steelworks, linoleum and oilcloth, high-grade tile, miscellaneous filler, other uses, and items indicated by footnote 1.

For the first time, production of miscellaneous clays exceeded the output of fire clay, even though the output of miscellaneous clays declined 9 percent in tonnage and 9 percent in value. Lower demand for miscellaneous clays for producing heavy clay products, and lightweight aggregate, offset a slight increase in the use of this clay for manufacturing cement.

Kaolin was again produced in Pennsylvania; output remaining approximately the same as in 1957. It was used to produce firebrick and block and portland cement (the more important use).

Clay was produced in 34 counties, 2 less than in 1957. Fire clay was produced in 19 counties, miscellaneous clay in 27 counties, and

TABLE 8.—Clays sold or used by producers in 1958, by counties

County	Short tons	Value	Types of clay
Adams	61,850	$31,600	Miscellaneous clay.
Allegheny	251,925	779,555	Do.
Armstrong	217,611	2,363,039	Fire clay.
Beaver	365,913	1,654,924	Fire clay, miscellaneous clay.
Blair	11,875	123,498	Do.
Butler	19,920	29,430	Do.
Cambria	45,387	(1)	Do.
Chester	72,744	90,930	Miscellaneous clay.
Clarion	59,186	322,708	Fire clay, miscellaneous clay.
Clearfield	404,689	3,885,648	Do.
Columbia	13,311	11,980	Miscellaneous clay.
Fayette	90,542	(1)	Fire clay, miscellaneous clay.
Lancaster	70,163	(1)	Do.
Lawrence	158,413	449,950	Do.
Luzerne	39,833	59,750	Miscellaneous clay.
Montgomery	54,913	(1)	Fire clay, miscellaneous clay.
Schuylkill	131,740	44,339	Miscellaneous clay.
Somerset	58,386	477,949	Fire clay.
Washington	32,980	44,339	Miscellaneous clay.
Westmoreland	5,940	4,752	Do.
Undistributed [2]	1,150,279	6,676,260	
Total [3]	3,317,600	17,050,651	

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties that must be concealed as indicated by footnote 1 and for the following counties: Berks, Bucks, Centre, Clinton, Cumberland, Dauphin, Elk, Huntingdon, Indiana, Jefferson, McKean, Northumberland, Snyder, and York.
[3] Incomplete total; excludes kaolin.

kaolin in 2 counties. Clearfield County led in production, with a value of $3.9 million; Beaver County ranked second in tonnage produced, followed, in decreasing order, by Allegheny, Jefferson, and Armstrong Counties. Clearfield County was the principal area for fire clay, while Allegheny County was the principal area for miscellaneous clay.

Gem Stones.—Activities of many gem clubs and societies increased. Eastern Pennsylvania continued to be the most popular source of gem materials. Substantial quantities of various types of gem stones were gathered for private collections or sale. The principal varieties collected were quartz, calcite, pyrite, sphalerite, galena, magnetite, and dolomite.

Graphite (Artificial).—Manufactured (artificial) graphite powder and products were produced by Speer Carbon Co., International Graphite & Electrode Division, at a plant in St. Marys. Work at the Chester Springs plant of Graphite Corp. of America was limited to research and development. The company estimated that production would begin in April 1959.

Iron Oxide Pigments.—Sulfur mud continued to be the only crude iron oxide pigment produced in Pennsylvania, with the output increasing in both tonnage and value. Crude iron oxide pigments were produced in Cambria and Elk Counties. Pennsylvania was the leading State in the production of finished natural and manufactured iron oxide pigments; however, its output decreased 5 percent in tonnage and increased 2 percent in value. The decrease in production was attributed principally to a cutback in the output of manufactured red iron oxide pigments and natural brown metallic oxides. Brown iron oxide, red iron oxide, and burnt umber were the principal finished natural iron oxide pigments, and red iron oxide, yellow iron oxide, and Venetian red, the principal manufactured iron oxide pigments.

Lime.—The production of lime dropped to the lowest rate since 1939, owing largely to a lower demand for lime by chemical and other related industries. Sales decreased 33 percent for agricultural and refractory uses and 23 percent for chemical and industrial uses. Of the total sold or used, 74 percent was quicklime and dead-burned

TABLE 9.—Lime sold by producers by uses

Year	Agricultural		Building		Chemical and industrial		Refractory		Total	
	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)	Short tons	Value (thousands)
1949–53 (average)	130,762	$1,481	121,853	$1,701	[1] 807,073	[1] $9,056	[2] 209,299	[2] $2,887	1,268,987	$15,125
1954	129,146	1,538	120,661	1,698	816,044	9,754	15,732	217	1,081,583	13,207
1955	118,274	1,430	118,727	1,530	1,083,043	13,179	104,007	1,493	1,424,051	17,632
1956	360,718	5,140	110,344	1,456	972,368	11,686	[3]	[3]	1,443,430	18,282
1957	286,720	4,469	110,815	1,874	900,866	12,063	[3]	[3]	1,298,401	18,406
1958	193,433	3,077	112,437	1,839	697,188	7,541	[3]	[3]	1,003,058	12,457

[1] Includes "Refractory" lime for 1950–51.
[2] 1952–53.
[3] Refractory lime included with "Agricultural" to avoid disclosing individual company confidential data.

TABLE 10.—Lime sold or used by producers, by counties

County	1957		1958	
	Short tons	Value	Short tons	Value
Armstrong	1,220	$14,658	1,019	$11,190
Centre	614,653	8,325,614	462,771	4,532,611
Dauphin	31,313	404,060	9,866	126,062
Franklin	2,307	20,763	2,046	15,549
Fulton	833	7,497	495	4,455
Lebanon	192,000	2,482,307	151,059	1,912,460
Mifflin	2,500	28,750	5,656	65,589
Montgomery	71,817	1,225,240	(1)	(1)
Northumberland	700	6,000	420	3,682
Snyder	890	8,010	1,301	9,755
Undistributed [2]	380,168	5,882,924	368,425	5,775,195
Total	1,298,401	18,405,823	1,003,058	12,456,548

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties that must be concealed as indicated by footnote 1 and for the following counties: Bedford, Blair (1958), Butler, Chester, Lancaster, and York.

dolomite, and 26 percent was hydrated lime. Approximately 1.8 million short tons of limestone was used in producing lime.

Twenty companies operated 22 plants in 16 counties in 1958. Centre County continued to be the leading producer, with 46 percent of the State's lime production. Centre, York, Lebanon, Chester and Montgomery Counties each had an output of over $1 million.

Magnesium Compounds.—Decreased demand for magnesium compounds, principally magnesia for insulation, continued the decline in the production from Pennsylvania plants. Magnesium carbonate was produced at Ambler and Plymouth Meeting from raw dolomite for use in producing magnesium oxide and magnesia for insulation purposes.

Mica.—Output of mica decreased in tonnage and value principally from decreased demand for ground mica for use by paint and rubber industries. The mica was mined and processed near Glenville and marketed for use in welding rods and as a mold lubricant for the rubber industry.

Perlite (Expanded).—Crude perlite mined in Western States was expanded at plants in Allegheny, Delaware, Lehigh, and Montgomery Counties. A total of 14,500 short tons valued at $795,500 was marketed from these plants—a decrease compared with 1957 of 14 and 18 percent, respectively. The expanded perlite was used principally as an aggregate in building plaster, with smaller quantities consumed as a filler, soil conditioner, concrete aggregate, and in insulation.

Pyrite.—For the second consecutive year the output of pyrite increased in both quantity and value. It was obtained as a byproduct of iron mining in eastern Pennsylvania and was processed at the Bethlehem Steel Co. plant at Steelton. Further processing was done at Wilmington, Del. for the recovery of cobalt.

Pyrophyllite (Sericite Schist).—Output of sericite schist decreased both in tonnage and value mainly because of a decline in demand for this material as a filler in asphaltic compounds. After processing,

sericite schist also was marketed as a carrier in insecticide chemicals and for use in joint-filler cements.

Roofing Granules.—The output of natural and artificially colored roofing granules decreased in both tonnage and value compared with 1957, owing mainly to a decreased demand for natural granules. Of the total production, artificially colored granules represented 87 percent. Three plants were active—one at Delta (York County) produced roofing granules from slate, one at Charmian (Adams County) used quartzite and basalt, and one at Darlington (Beaver County) used clay. Stone flour was produced, in addition to roofing granules.

Sand and Gravel.—Decreased construction and highway building hampered the growth of the sand and gravel industry. A 5-percent increase in demand for sand and gravel as paving material did not suffice to overcome a decrease in the demand for construction material, resulting in an overall 5-percent decrease in commercial operations.

Sand was sold for nine major uses, of which only grinding and polishing sand showed increases in sales. Sand for building purposes decreased 4 percent in tonnage and 2 percent in value and paving sand increased slightly in both tonnage and value, mainly as a result of the production reported by Government-and-contractor operations. Sales of engine, molding, fire, and ground sands declined.

A total of 97 commercial operators was active, of which 94 produced sand and 61 produced gravel. Three sand operations produced over 400,000 short tons of sand, 12 operations over 100,000 tons, 18 operations 50,000 to 99,999 tons, and 34 operations 10,000 to 49,999 tons. Of the 61 gravel operations 1 plant produced over 1 million tons, 8 operations 100,000 to 999,999 tons, and 18 plants each producing 50,000 to 99,999 tons and 18 plants 10,000 to 49,999 tons. Of the total commercial sand and gravel tonnage 53 percent was transported by truck, 31 percent by waterways, and 15 percent by railroad. Ninety-eight percent of the sand and gravel production was washed or otherwise processed before use.

Commercial production of sand and gravel was reported in 43 counties, 2 more than in 1957. Fulton and Washington Counties were added to the 1958 lists, while operations in Cambria County were discontinued. Fifteen counties reported increases in production, but the remaining counties showed decreases. Bucks County was the leading producer of sand and gravel, with 29 percent of the State's total tonnage and 24 percent of the State's total value although showing a production decrease of over 400,000 short tons. Other leading counties in decreasing order were Armstrong, Lycoming, and Huntingdon. Government-and-contractor production was reported from Dauphin and Susquehanna Counties, compared with 1957 production from Centre County only.

Slag (Iron-Blast-Furnace).—Output of blast-furnace slag declined owing primarily to cutbacks in the steel industry. The output of all types of slag decreased from 8.2 million short tons to 7.2 million. The value of output also decreased from $11.8 million to $11.3 million. Air-cooled (screened) blast-furnace slag was produced at 21 plants, granulated slag at 5 plants, and lightweight slag at 5 plants. Screened air-cooled output decreased from 6 million short tons to 5.3 million at a value of $9.9 million to $9.3 million. Pennsylvania was the leading producer of blast-furnace slag.

TABLE 11.—Sand and gravel sold or used by producers, by uses

Use	1957		1958	
	Short tons	Value	Short tons	Value
COMMERCIAL OPERATIONS				
Sand:				
Molding	(1)	(1)	151,243	$457,555
Building	3,630,924	$4,812,433	3,488,941	4,931,685
Paving	1,884,880	2,828,916	1,878,762	2,809,596
Engine	(1)	(1)	53,451	110,612
Other	233,272	453,888	165,506	428,360
Undistributed [2]	1,318,629	4,280,659	840,095	3,214,234
Total	7,067,705	12,375,896	6,577,998	11,952,042
Gravel:				
Building	3,456,047	4,760,230	3,258,596	4,593,614
Paving	1,527,864	2,204,341	1,707,011	2,442,856
Undistributed [3]	197,432	174,235	119,830	112,688
Total	5,181,343	7,138,806	5,085,437	7,149,158
Total sand and gravel	12,249,048	19,514,702	11,663,435	19,101,200
GOVERNMENT-AND-CONTRACTOR OPERATIONS				
Sand:				
Building	44,239	15,484	----------	----------
Paving	----------	----------	161,589	78,770
Total	44,239	15,484	161,589	78,770
Gravel: Building	112,367	39,328	----------	----------
Total	112,367	39,328	----------	----------
Total sand and gravel	156,606	54,812	161,589	78,770
Grand total	12,405,654	19,569,514	11,825,024	19,179,970

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes glass, grinding and polishing, fire or furnace, filter (1958), and ground sand.
[3] Includes railroad ballast and other uses.

TABLE 12.—Sand and gravel sold or used by producers in 1958, by counties and areas

Area and county	Short tons	Value	Type of operation			Kind of material	Transportation			Principal population centers in area
			Stationary	Portable	Dredge		Rail	Water	Truck	
Northwestern:										
Crawford	103,092	$154,417	5			Building and paving sand and gravel, fill gravel	X		X	Erie. New Castle. Sharon.
Erie	150,050	214,316	4			Building and paving sand and gravel, molding sand	X		X	
Forest, Venango, Warren	388,585	750,346	5		2	Building and paving sand and gravel, fire and furnace sand, molding sand.	X		X	
Lawrence, Mercer	710,747	1,006,207	5			Building and paving sand and gravel, filter and fill sand.	X	X	X	
Total	1,352,474	2,125,286	19		2					
Southwestern:										
Allegheny, Armstrong, Beaver, Fayette	1,975,593	3,745,959	6		3	Building and paving sand and gravel, molding sand, fill sand and gravel, railroad ballast gravel, and other uses.	X		X	Butler. McKeesport. Pittsburgh. Uniontown. Washington.
							X	X	X	
								X	X	
							X	X	X	
Butler	123,993	176,462	3			Building sand and gravel			X	
Somerset	900	2,750	2			Building sand and other sand			X	
Total	2,100,486	3,925,171	11		3					
North Central:										
Clearfield, Elk, Lycoming, McKean	(1)	(1)	4	1		Building and paving sand and gravel, railroad gravel, engine, molding, and other sands.			X	Williamsport.
									X	
							X		X	
							X		X	
South Central:										
Bedford, Blair, Dauphin, Fulton, Huntingdon, Mifflin, York	(1)	(1)	13	1	1	Building and paving sand and gravel; glass, molding, grinding, engine, fire and furnace and other sands, ground sands (abrasive, enamel, foundry, filler, glass, pottery, and other).			X	Altoona. Harrisburg. Johnstown. York.
									X	
									X	
							X		X	
							X	X	X	
							X		X	
Cumberland	108,936	176,232	3			Building and paving sand			X	
Franklin	132,905	199,641	2			Building sand			X	
Northumberland	10,621	11,985	2			Building, molding, and fill sand			X	
Undistributed [2]	2,426,777	5,126,526								
Total	2,679,239	5,514,384	24	2	1					

Northeastern:										
Bradford	467,799	532,618	5			Building and paving sand and gravel and engine sand.			X	Hazleton. Scranton. Wilkes-Barre.
Columbia							X		X	
Wyoming							X		X	
Carbon	197,009	297,397	5			Building, paving, fire and furnace sand, and engine sand.	X		X	
Luzerne	433,234	526,915	4			Building and paving sand and gravel and engine sand.			X	
Monroe	67,206	84,988	3			Building and paving sand and gravel and other sand			X	
Susquehanna	74,949	81,690	4			Building and paving sand and gravel			X	
Wayne									X	
Total	1,240,197	1,523,608	21							
Southeastern:										
Berks	260,336	339,451	6			Building and paving sand and gravel and fill gravel			X	Allentown. Bethlehem. Chester. Lancaster. Philadelphia. Reading.
Montgomery									X	
Northampton									X	
Bucks	3,386,427	4,677,701	9			Building and paving sand and gravel and molding sand.	X	X	X	
Lancaster	176,214	380,880	3			Building, paving and fire and furnace sand	X		X	
Philadelphia	533,023	399,767			1	Building sand and gravel		X		
Schuylkill	96,628	293,722	1			Paving and fire and furnace sand	X		X	
Total	4,452,628	6,091,521	19		1					
Grand total	11,825,024	19,179,970	94	2	7					

[1] Included with "Undistributed" to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties that must be concealed as indicated by footnote 1.

Stone.—Output of stone (including slate) decreased in both tonnage and value (7 percent and 10 percent, respectively). The decline was due primarily to lower demand for dimension stone as rubble and for rough architectural purposes and crushed or broken stone as riprap, flux, railroad ballast, and refractory material and for agricultural purposes. Rough architectural consumption decreased 16 percent, flux 39 percent, railroad ballast 36 percent, and agricultural purposes 9 percent. The only crushed stone usage to show a significant increase was for concrete aggregate. Stone (sandstone, granite, basalt, limestone, shell, miscellaneous stone, and slate) was produced in 44 of the 67 counties, giving Pennsylvania rank as a leading stone-producing State.

Output of limestone, the leading stone produced, decreased as an increase of 12 percent in demand for crushed limestone as concrete aggregate did not offset a 39-percent decrease in demand for flux, a 9-percent drop for agricultural purposes, and a sharp decline for limestone as railroad ballast. A lower demand for dimension limestone as rubble and rough construction material caused a decline in this phase of the limestone industry. Crushed limestone came from 34 counties; Northampton County led in output, with 5.6 million tons, followed in decreasing order by counties producing over 2 million tons—Montgomery, Lawrence, and York. Dimension limestone was produced in Bucks and Lancaster Counties—Bucks County leading. No dimension limestone was produced in Chester County, as was the case in 1957.

Basalt, in contrast with other stone produced in Pennsylvania, showed an increase in tonnage. This rise was due primarily to a greater demand for basalt as concrete aggregate (15 percent); however, all other uses of crushed basalt except riprap showed decreases. The output of dimension basalt dropped, owing to a lower demand for this stone in rough construction. Crushed basalt was produced in

TABLE 13.—Stone sold or used by producers, by uses

Use	1957		1958	
	Short tons	Value	Short tons	Value
Dimension stone:				
Building stone [1]	211,379	$1,580,456	160,067	$1,218,119
Other uses			49,419	3,303,682
Total dimension stone	211,379	1,580,456	209,486	4,521,801
Crushed and broken stone:				
Riprap	(2)	(2)	27,441	23,645
Concrete and road metal	16,686,666	25,185,979	18,537,260	28,025,216
Furnace flux (limestone)	8,958,591	16,151,026	5,443,191	9,806,835
Railroad ballast	1,166,649	1,915,052	749,066	1,181,230
Refractory	306,194	3,838,049	(3)	(3)
Agricultural	856,641	2,756,244	776,764	2,497,005
Other uses [4]	15,071,438	21,662,688	14,305,954	23,637,826
Total crushed and broken stone	43,046,179	71,509,038	39,839,676	65,171,757
Grand total	43,257,558	73,089,494	[5] 40,049,162	[5] 69,693,558

[1] Includes "Curbing and flagging" to avoid disclosing individual company confidential data.
[2] Included with "Concrete and road metal."
[3] Included with "Other uses."
[4] Includes oystershell.
[5] Includes slate.

eight counties and dimension basalt in three counties. The leading county for crushed material was Chester and for dimension stone, Bucks.

Sandstone, third-ranking stone in Pennsylvania, was marketed as both dimension and crushed stone; it decreased 11 percent in tonnage and 14 percent in value. The reduced output resulted principally from a decreased demand for crushed sandstone as refractory material and railroad ballast. Use of sandstone as refractory material decreased 31 percent compared with 1957; effecting an overall decrease of 10 percent in the production of crushed sandstone. Twenty-seven percent less dimension sandstone was marketed with all uses decreasing. Sandstone was prepared as rough construction, rubble, rough architectural, dressed monumental, curbing, and flagging stone. Sandstone was produced in 24 counties, with dimension sandstone in 12 counties and crushed sandstone in 19. Allegheny, Delaware, Lycoming, and Potter Counties produced dimension stone only. Luzerne County was the leading producer of crushed sandstone, followed in decreasing order by Westmoreland, Susquehanna, Wayne, and Lehigh Counties, all producing over 100,000 short tons. A leading county for dimension sandstone was Montgomery.

The output of miscellaneous stone in Pennsylvania decreased 26 percent. Although the demand for dimension miscellaneous stone as flagging material increased slightly, the use of crushed miscellaneous stone as rough construction, rubble, and concrete aggregate decreased sharply. Dimension miscellaneous stone was produced in four counties, of which Delaware and Westmoreland were leaders. Crushed and dimension miscellaneous stone was produced in Montgomery County.

Dimension granite was prepared and marketed from quarries in Pennsylvania for use as rubble, in rough construction, and for architectural material. Sales of granite as rough architectural stone decreased, while sales for other uses increased. Delaware County continued to be the only one where dimension granite was produced.

Oystershell was collected in Berks County and processed for agricultural purposes.

The Pennsylvania slate industry continued to rank first in the United States in value of output despite a 6-percent drop in quantity and a 4-percent decrease in value. Lower demand for slate as flagging material, granules, flour, and roofing material contributed to the decline of the industry. The market for structural slate and blackboard slate increased, but decreases were noted in roofing, electrical, billiard, flagging, granules, and flour. Fifteen operators were active in producing slate—12 in Northampton County and 1 each in Lehigh, Lycoming, and York Counties. Northampton County furnished 40 percent of the tonnage and 79 percent of the value of output. Output from Northampton and York Counties decreased considerably, while production in Lehigh and Lycoming increased slightly.

Slate was exported from Pennsylvania to Canada, South America, Mexico, the Union of South Africa, Cuba, and Costa Rica. Exports,

TABLE 14.—Stone sold or used, by counties

County	1957		1958	
	Short tons	Value	Short tons	Value
Allegheny	9,030	$30,949	(1)	(1)
Berks	(1)	(1)	2,421,954	$2,871,294
Blair, Huntingdon	(1)	(1)	1,292,864	3,544,709
Bucks	667,519	1,282,113	723,545	1,378,818
Butler	2,197,164	4,224,471	911,054	1,721,255
Carbon	88,255	1,226,700	(1)	(1)
Centre	2,107,910	3,901,388	1,786,483	3,328,604
Chester	1,795,129	3,258,916	(1)	(1)
Cumberland	137,033	282,836	(1)	(1)
Dauphin, Lebanon, Perry	(1)	(1)	3,097,531	5,219,468
Delaware, Chester	(1)	(1)	3,486,163	6,634,978
Fayette, Somerset	(1)	(1)	574,051	1,094,813
Franklin	428,527	718,736	595,540	971,805
Huntingdon	503,048	1,840,389	(1)	(1)
Indiana	300	1,200		
Juniata, Mifflin, Snyder	(1)	(1)	805,623	1,292,431
Lancaster	2,022,971	3,106,309	1,872,585	3,047,407
Lawrence	(1)	(1)	3,102,531	5,361,898
Lebanon	2,861,601	5,226,348	(1)	(1)
Lehigh, Northampton	7,495,121	7,406,528	7,538,588	10,368,901
Luzerne, Susquehanna, Wyoming	413,468	815,311	354,671	717,095
Mercer	4	1,091	11,808	39,944
Monroe, Carbon, Schuylkill	(1)	(1)	397,445	1,854,012
Montgomery	3,797,478	6,625,753	3,644,264	6,151,576
Northumberland	19,600	29,400	58,700	100,950
Potter	5,104	142,072	(1)	(1)
Schuylkill	89,671	594,301	(1)	(1)
Union	249,981	413,413	212,950	356,300
Wayne	190,074	354,142	115,343	246,471
Westmoreland	294,699	658,021	520,904	961,715
York	2,911,603	4,833,049	(1)	(1)
Undistributed [2]	14,972,268	26,116,058	6,524,565	12,429,114
Total [3]	43,257,558	73,089,494	[4] 40,049,162	[4] 69,693,558

[1] Figure withheld to avoid disclosing individual company confidential data.
[2] Includes tonnage and value for counties as indicated by footnote 1 and the following counties: Adams, Armstrong, Bedford, Clinton, Fulton, Lycoming, and Montour.
[3] Includes oystershell.
[4] Includes slate.

in decreasing order, were blackboard slate, flour, slate granules, structural slate, roofing slate, and billiard slate.

Sulfur.—Byproduct sulfur was recovered in the liquid purification of gas obtained from domestic and foreign deposits. Sinclair Refining Co. (Marcus Hook, Delaware County) and Gulf Oil Corp. (Philadelphia) recovered sulfur, using the Claus process. Sun Oil Co., at its Marcus Hook, Delaware County, operation, recovered sulfur, using a two-stage, catalytic oxidation of hydrogen sulfide. The Atlantic Refining Co. (Philadelphia) recovered hydrogen sulfide by the Girdler system, using diethanolamine and monoethanolamine, which was burned for the production of hydrogen sulfide and used at the plant.

Tripoli.—The output of tripoli (rottenstone), was slightly less than in 1957. The crude material was ground at two plants in Lycoming County and marketed principally as a buffing compound and filler.

Vermiculite (Exfoliated).—Crude vermiculite from Western States and foreign countries was exfoliated at plants in Bucks, Clearfield, and Lawrence Counties. The exfoliated vermiculite was used to make cements, insulating refractories and construction insulation and for horticultural uses.

Cadmium.—Cadmium was recovered from zinc dust collected in the early stages of distillation in the vertical retorts at the St. Joseph Lead Co. Josephtown plant. New Jersey Zinc Co. operated its Palmerton smelter for collecting dust containing cadmium.

Ferroalloys.—Eight major categories of ferroalloys were produced, with a total output of 412,300 short tons. Shipments of ferromanganese, spiegeleisen, chrome-tungsten, nickel-tungsten, ferrotungsten, ferroboron, ferrocolumbium, and ferromolybdenum totaled 378,000 tons, at a value of $95.1 million.

Iron Ore.—The first shipment of concentrated iron ore from the Bethelehem Steel Co. new Grace mine, Berks County, was reported in November, bringing to production a multimillion-dollar project that began in 1948. However, combined shipments of usable iron ore from this mine and the Cornwall mine were less than the output in 1957, chiefly because of lower demand. All ore produced at the underground mines was shipped to the Lebanon concentrator for processing. Iron shipments from the concentrator consisted of sinter and pellet for use in producing pig iron and steel. The copper concentrate produced at the concentrator was shipped to a smelter at Laurel Hill, N. Y., to recover copper, silver, and gold. The pyrite concentrate was shipped to the company plant at Sparrows Point, Md., for roasting out the sulfur, which was used in manufacturing sulfuric acid. The pyrite cinder was shipped from Sparrows Point to Wilmington, Del., for the recovery of the cobalt.

The Grace mine was being developed on the 1,812-, 1,916-, 2,210-, and 2,314-foot levels. The block-caving method of mining was being used to recover the ore. With the mine in full operation, the daily production of raw ore and rock was estimated to be 10,000 to 12,000 tons.

Iron and Steel Scrap.—Ferrous scrap was collected and prepared principally in Allentown, Harrisburg, Norristown, Scranton, Tarentum, Philadelphia, Pittsburgh, and Wilkes-Barre. Of the scrap processed and shipped, the leading varieties were Nos. 1 and 2 heavy-melting steel, No. 1 and electric furnace bundles, No. 2 heavy-melting steel, and cast-iron scrap other than moldings. Of the total scrap available for consumption, 66 percent was home scrap and 34 percent purchased scrap.

Pig Iron.—Steel production dropped sharply. Blast furnaces were operated at approximately 58 percent of capacity and produced 14.5 million tons of pig iron (31 percent less than that produced in 1957). Production of steel was approximately 56 percent of capacity; production fell approximately 31 percent, compared with 1957. Pig iron and B. F. ferroalloy was produced by 14 companies operating 22 plants having 79 stacks. The classes of pig iron produced in 1958 were basic, Bessemer, malleable, foundry, low-phosphorus, and direct casting. More basic and Bessemer pig iron was produced than any other class, totaling 12.2 million short tons for basic and 1.6 million tons for Bessemer, a decrease of 29 and 39 percent, respectively. A total of 9.9 million tons of domestic iron ore, 3.7 million tons of foreign iron ore, 606,000 tons of mill cinder and roll scale, 17,000 tons of flue dust, 8.4 million tons of sinter, and 281,000 tons of other

TABLE 15.—Annual capacity of blast furnaces, January 1, 1959, in short tons

[American Iron and Steel Institute]

Company	Location of plant	Number of stacks	Total annual capacity (short tons)
	Allegheny County:		
U.S. Steel Corp. (central operations)	Braddock	7	2,904,400
Do	Clairton	3	821,900
Do	Duquesne	[1] 6	1,473,600
National Tube Division	McKeesport	4	1,308,000
Pittsburgh Coke & Chemical Co	Neville Island	2	654,000
Jones & Laughlin Steel Corp	Pittsburgh	6	2,105,000
U.S. Steel Corp. (central operations)	Rankin	6	2,453,400
	Beaver County:		
Jones & Laughlin Steel Corp	Aliquippa	5	2,090,000
Crucible Steel Co. of America	Midland	3	895,000
Colorado Fuel & Iron Corp	Berks County: Birdsboro	1	151,200
U.S. Steel Corp. (central operations)	Bucks County: Fairless Hills	3	1,878,000
Bethlehem Steel Co	Cambria County: Johnstown	[2] 7	2,190,000
New Jersey Zinc Co	Carbon County: Palmerton	[3] 2	112,000
Bethlehem Steel Co	Dauphin County: Steelton	3	1,020,000
Barium Steel Corp. (Phoenix Iron & Steel Co.).	Delaware County: Chester	1	200,000
Interlake Iron Corp	Erie County: Erie	1	271,000
Lavino & Co., E. J	Lebanon County: Sheridan	[4] 1	56,000
	Mercer County:		
Sharon Steel Corp	Farrell	2	735,000
Shenango Furnace Co	Sharpsville	2	445,450
Alan Wood Steel Co	Montgomery County: Swedeland	2	544,200
Bethlehem Steel Co	Northampton County: Bethlehem	7	2,720,000
American Steel & Wire Division	Washington County: Donora	2	450,000
Pittsburgh Steel Co	Westmoreland County: Monessen	3	950,000

[1] Includes 302,500 tons ferroalloys capacity.
[2] Includes 240,000 tons ferroalloys capacity.
[3] Spiegeleisen only.
[4] Ferromanganese only.

agglomerates, and 966,000 tons of pellet was consumed in the blast furnace. Beside metalliferous materials, 439,000 tons of home scrap, 134,000 tons of slag scrap, 342,000 tons of purchased scrap, 1.3 million tons of open-hearth and Bessemer slag, 11.7 million tons of coke, and 4.5 million tons of limestone and dolomite were consumed in the blast furnaces. Scrap produced and flue dust recovered at blast furnaces totaled 216,000 and 1.2 million tons, respectively. Seven million tons of slag also was produced.

Despite the decline in steel production, capacity increased 4 percent and totaled 38,480,000 tons. Of this total, open-hearth capacity was 34,701,000, electric and crucible 2,615,000; and Bessemer and oxygen converting, 1,164,000, (no new open-hearth and Bessemer and oxygen-converting furnaces were put into operation in 1958). The number of open-hearths decreased from 288 to 286 and Bessemer and oxygen furnaces remained at 8. However, 13 new electric crucible furnaces were put into operation, bringing the total to 104. Of the total steel production, open-hearth furnaces produced 90 percent.

Zinc.—Zinc production commenced on January 21 at the Friedensville mine, reviving the zinc-mining industry in Pennsylvania. Concentrate produced at Friendensville, Lehigh County, was shipped by truck to a smelter at Palmerton, a distance of less than 25 miles. According to the company annual report, over $2 million was spent for mine development.

Smelters.—Two zinc smelters were active. The Palmerton plant of New Jersey Zinc Co., using vertical retorts, processed crude ore or

concentrate from company operations at Sterling Hill, N. J.; Austinville, Va.; Eagle, Colo.; Friedensville, Pa.; and Jefferson City, Tenn. Both zinc and lead were produced. The Josephtown smelter of the St. Joseph Lead Co. processed material received from the company Edwards and Balmat, N. Y., mines, as well as material from other States and foreign countries. Vertical retorts were used to recover the zinc.

REVIEW BY COUNTIES

Adams.—Bethlehem Limestone Co. produced and crushed limestone at the Hanover quarry and plant west of Hanover. The crushed stone was used principally as blast-furnace flux, concrete aggregate, roadstone, and stone sand. Quantities of the stone were sold under contract to government agencies for road construction. The company installed three crushers for making sinter flux. Tunnels and service buildings were erected at West Plant Lake for water storage. The Funkhouser Mills quarried basalt at the Charmian quarry and crushed and ground the stone for use as roofing granules and stone flour.

Summit Mining Corp. operated the Heller mine, 3 miles west of Bendersville, to recover sericite schist. The crude sericite schist was trucked to the company plant at Aspers, where it was crushed, screened, and ground for use in asphaltic compounds and joint cements as a filler and in insecticides. Liberty Stone Co. produced soapstone at a pit near Fairfield and shipped the crude material to the company plant at Marriottsville, Md., for processing.

TABLE 16.—Value of mineral production in Pennsylvania, by counties [1] [2] [3]

County	1957	1958	Minerals produced in 1958 in order of value
Adams	(4)	(4)	Stone, sericite schist, clays.
Allegheny	$59, 809, 854	$45, 620, 873	Coal, cement, clays, sand and gravel, stone.
Armstrong	17, 486, 325	(4)	Coal, sand and gravel, clays, lime, stone.
Beaver	(4)	(4)	Clays, coal, sand and gravel.
Bedford	1, 661, 061	1, 620, 266	Stone, coal, lime, sand and gravel.
Berks	9, 604, 834	9, 411, 867	Cement, stone, clays, crude iron oxide pigments, sand and gravel, gem stone.
Blair	2, 110, 450	1, 982, 391	Stone, coal, clays, sand and gravel, lime.
Bradford	(4)	(4)	Coal, sand and gravel.
Bucks	(4)	(4)	Sand and gravel, stone, clays, gem stone.
Butler	17, 027, 113	13, 648, 257	Coal, cement, lime, stone, sand and gravel, clays.
Cambria	71, 430, 438	53, 453, 928	Coal, clays, crude iron oxide pigments.
Cameron	(4)	(4)	Coal.
Carbon	10, 023, 818	(4)	Coal, stone, sand and gravel, gem stone.
Centre	15, 044, 014	(4)	Lime, coal, stone, clays.
Chester	[5] 4, 548, 537	5, 664, 017	Stone, lime, clays, gem stone.
Clarion	12, 181, 928	10, 658, 426	Coal, clays.
Clearfield	(4)	(4)	Coal, clays, sand and gravel.
Clinton	2, 650, 497	2, 530, 185	Coal, stone, clays.
Columbia	(4)	(4)	Coal, sand and gravel, clays.
Crawford	137, 984	154, 417	Sand and gravel.
Cumberland	461, 640	(4)	Stone, sand and gravel, clays, gem stone.
Dauphin	[5] 4, 198, 673	3, 645, 000	Stone, coal, clays, sand and gravel, lime.
Delaware	(4)	(4)	Stone, gem stone.
Elk	1, 596, 227	1, 654, 417	Coal, clays, sand and gravel, crude iron ox pigments.
Erie	(4)	(4)	Sand and gravel, peat.
Fayette	40, 836, 337	19, 646, 651	Coal, stone, clays, sand and gravel.
Forest	(4)	(4)	Sand and gravel.
Franklin	925, 512	1, 183, 313	Stone, sand and gravel, lime.
Fulton	(4)	(4)	Do.
Greene	80, 300, 164	62, 201, 305	Coal.
Huntingdon	4, 333, 799	5, 065, 357	Sand and gravel, stone, coal, clays.
Indiana	(4)	(4)	Coal, clays.

See footnotes at end of table.

TABLE 17.—Value of mineral production in Pennsylvania, by counties [1] [2] [3]—Con.

County	1957	1958	Minerals produced in 1958 in order of value
Jefferson	(4)	(4)	Coal, clays.
Juniata	(4)	(4)	Stone.
Lackawanna	$26,503,139	$19,938,059	Coal.
Lancaster	[5] 5,369,941	(4)	Stone, coal, sand and gravel, clays, lime, gem stone.
Lawrence	22,084,103	(4)	Cement, coal, stone, clays, sand and gravel, peat.
Lebanon	22,039,326	18,967,978	Iron ore, copper, lime, stone, pyrite, gold, coal, silver, gem stone.
Lehigh	(4)	(4)	Cement, zinc, stone (slate), gem stone.
Luzerne	(4)	68,949,149	Coal, sand and gravel, stone, peat, clays, gem stone.
Lycoming	1,708,075	1,555,434	Stone (slate), sand and gravel, coal, tripoli.
McKean	614,601	455,381	Clays, coal, sand and gravel.
Mercer	2,607,174	3,101,323	Coal, sand and gravel, stone, peat.
Mifflin	(4)	(4)	Sand and gravel, stone, lime.
Monroe	(4)	(4)	Stone, sand and gravel, gem stone.
Montgomery	[5] 13,586,798	12,620,278	Stone, cement, lime, clays, sand and gravel, gem stone.
Montour	(4)	(4)	Stone.
Northampton	(4)	(4)	Cement, stone (slate), sand and gravel, coal, gem stone.
Northumberland	(4)	(4)	Coal, clays, stone, sand and gravel, lime.
Perry	(4)	(4)	Stone, gem stone.
Philadelphia	415,045	399,767	Sand aud gravel.
Potter	142,072	(4)	Stone.
Schuylkill	74,040,576	(4)	Coal, stone, sand and gravel, clays, gem stone.
Snyder	382,348	477,614	Clays, coal, stone, lime.
Somerset	21,797,665	(4)	Coal, clays, stone, sand and gravel.
Sullivan	(4)	88,755	Coal.
Susquehanna	426,810	(4)	Stone, coal, sand and gravel.
Tioga	(4)	1,465,869	Coal.
Union	413,413	356,300	Stone.
Venango	(4)	(4)	Coal, sand and gravel.
Warren	(4)	(4)	Sand and gravel.
Washington	91,826,557	69,836,603	Coal, clays, sand and gravel.
Wayne	459,780	(4)	Stone, coal, sand and gravel.
Westmoreland	(4)	21,052,979	Coal, stone, clays.
Wyoming	(4)	(4)	Sand and gravel, stone.
York	[5] 14,563,039	14,902,598	Cement, stone (slate), lime, sand and gravel, clays, mica, gem stone.
Undistributed	[5] 421,807,033	408,872,136	
Total	[5] 1,077,157,000	881,181,000	

[1] Pike County is not listed because no production was reported.
[2] Excludes value of production for LP-gases, natural gasoline, petroleum, and some gem stone unspecified by counties, but value is included with "Undistributed."
[3] Excludes values of clays and stone used in manufacturing lime and cement.
[4] Figure withheld to avoid disclosing individual company confidential data.
[5] Revised figure.

Miscellaneous clay used for building brick and drain tile was recovered from open pits by Alwine Brick Co. (New Oxford) and Gettysburg Drain Tile Works (Gettysburg).

Allegheny.—Underground tonnage comprising 92 percent of the total bituminous coal production was mined at 32 mines, 6 fewer than 1957. A total of 129 cutting machines cut 4.5 million tons of coal; 4.4 million tons of coal was mechanically loaded and 3.4 million tons mechanically cleaned. Twenty-five strip mines, 2 less than in 1957, produced 424,000 tons of coal. Thirty-seven power shovels and 8 draglines were used at the strip mines.

Universal Atlas Cement Co., Division of U. S. Steel Corp., produced air-entrained and non-air-entrained portland cement and Atlas mortar cement by the dry process at its two-kiln cement plant at Universal. Pittsburgh Coke and Chemical Co. (Neville Island) produced portland and masonry cements by the wet process.

Although clay production dropped 8 percent, Allegheny was the leading miscellaneous-clay-producing county for the second consecutive year. Six companies mined clay for making brick and tile.

Bridgeville Brick Co. (Bridgeville) continued as the largest clay producer in the county. Smaller quantities of miscellaneous clay were recovered near Creighton, North Bessemer, Pitcairn, and Wilkinsburg.

McCrady, Inc., previously known as James H. McCrady, Jr. (Harmarville), and Sidwell Loam Sand Co. (Cheswick) produced only molding sand and sand for other uses. Production of sand and gravel continued the steady decline that began in 1954.

Dimension sandstone for use as rubble was quarried at Cuddy by Francis Matesia. The company discontinued operations in July. Malli Mines (Jefferson Borough) produced irregular-shaped dimension sandstone for rough construction.

Panacalite Perlite Co. (Pittsburgh) and Perlite Manufacturing Co. (Carnegie) expanded perlite from crude material obtained from Nevada and New Mexico.

Armstrong.—Bituminous coal was produced from 99 mines—10 less than were active in 1957. Of these, 56 were underground, 37 strip, and 6 auger. Slightly over one-half of the total tonnage was produced from underground mines. A total of 1.1 million tons was cut mechanically, using 46 machines. Twenty-eight percent of the underground tonnage was cleaned mechanically. Fifty-nine power shovels and 17 draglines were active at 37 strip mines.

Armstrong County remained the second-ranking sand-and-gravel-producing county. J. K. Davison and Bros. (operating a dredge along the Allegheny River near Ford City) and Glacial Sand and Gravel (Tarrtown near Kittanning) and Manorville Sand Co. (Manorville), both having stationary plants, were among the 20 leading producers in the State. The output from these plants was used primarily as structural and paving material. Only a small portion of the sand and gravel produced was shipped to the consumer as unprepared material.

Although production and value of clay declined, the county again ranked fifth in clay production and second in total clay value. Clay output from seven underground operations (one each at Adrian, Freeport, New Bethlehem, and Templeton) and three at Kittanning was used to produce firebrick and block and heavy clay products. Clays obtained from two open-pit operations (one near Craigsville, the other near Worthington) were used in manufacturing heavy clay products.

Walter Hershberger, C. D. McCanna, and Robert E. Toy (all near Kittanning) produced and sold hydrated agricultural lime.

Michigan Limestone Division, U. S. Steel Corp., discontinued operation of the Kaylor limestone mine in October 1957. Limestone crushed and used solely in manufacturing lime was produced by two companies, both near Kittanning.

Beaver.—Despite an appreciable decrease in output, Beaver County was the second-ranking clay-producing area. Slightly less than three-fourths of the total clay mined came from open-pit operations, with the remainder from underground mines. Of 11 companies reporting production, the leading producers were Ralph A. Veon, Inc. (Darlington), The Negley Fire Clay Co. (New Galilee), McQuiston Coal Co. (Darlington), Standard Clay Manufacturing Co. (Fallston), and Eastvale Clay Products Co. (Beaver Falls). Plastic

and burley fire clays were sold or used for pottery, refractories, and heavy clay products. Miscellaneous clay was used for pottery and heavy clay products. The Brush Run mine operated by Davis Coal Co. was inactive.

Eighty-six percent of the bituminous coal production came from 13 strip mines, 11 percent from 3 underground mines, and the remainder from 1 auger mine. Two more strip mines were active in 1958 than in 1957. Nineteen power shovels and 8 draglines were used to produce 197,000 short tons of bituminous coal. At the three underground mines two cutting machines were used to cut 22,000 short tons of coal, of which 8,000 tons was mechanically loaded. None of the 229,000 tons of coal produced underground was mechanically cleaned.

Sand and gravel recovered by dredge was further processed as building and paving sand and gravel by the Shippingport Sand and Gravel Co. at its Shippingport plant. Lee Block Co. near Industry produced building sand and gravel and gravel for fill.

Bedford.—Two companies produced and crushed limestone from quarries and plants near Everett and Hyndman, principally for use as concrete aggregate, roadstone, asphalt fill, and agricultural purposes. Crushed and sized ganister rock for use in foundries and steel mills and making ferrosilicon was mined at the Leap No. 1 quarry by Leap Ganister Rock Co. (Madley).

Thirty-two mines (28 underground and 4 strip) were active. Seventy-five percent of the bituminous coal production came from underground mines. A total of 47,000 short tons was mechanically loaded, but none of the coal was mechanically cleaned. Three power shovels and a dragline were used for producing strip-mine coal.

New Enterprise Stone and Lime Co. produced hydrated lime for agricultural use at its Aschom plant near Everett. J. Mason Kerr (Hyndman) operated one kiln, producing quicklime.

Feight Bros. recovered sand from a pit near Everett and processed the sand at an adjacent fixed plant for use as building material.

Berks.—Air-entrained and non-air-entrained portland cement and "Allentown" masonry cement were produced at the five-kiln Evansville No. 1 plant of the Allentown Portland Cement Co.

Four companies operated five limestone quarries and one cement-rock quarry near Evansville, Oley, Kutztown, Sinking Spring, and South Temple, producing crushed and broken stone principally for use as concrete aggregate and roadstone and for manufacturing cement. Some stone was sold to government agencies as road material. The John T. Dyer Quarry Co. recovered basalt from the Clingan quarry (Birdsboro) and crushed and sized the stone at the local plant for use as road material and railroad ballast. The company Birdsboro quarry was not operated during the year. Oystershell was crushed by Reading Poultry Feed Co. (Reading) for use in mineral food and poultry grit.

Miscellaneous clay and shale taken from open pits by the Reading Shale Div. and Shoemakersville Div. of Glen-Gery Shale Brick Corp. was used in manufacturing building brick.

Bethlehem Cornwall Corp., a subsidiary of Bethlehem Steel Co., began commercial production of crude iron ore at its new Grace underground mine near Morgantown. A new mill was being con-

structed for grinding, flotation, and preparation of iron concentrate and pyrites.

Two producers operating fixed plants, one near Sinking Spring and the other near Temple, furnished sand and gravel for building and paving use.

Gem stones and mineral specimens collected in the county near Gibraltor, Morgantown, and Temple included zeolite, magnetite, pyrite, calcite, and hematite.

Blair.—Limestone was recovered from five quarries near Hollidaysburg, Claysburg, and Altoona. The bulk of the output was used as concrete aggregate and roadstone. Basalt Traprock Co. (near Williamsburg) quarried, crushed, and sized quartzite, mainly for railroad ballast and road material. General Refractories Co. operated the Claysburg quarry and plant, producing crushed quartzite for manufacturing silica brick. J. L. Hartman reported that the Sara Furnace quarry (near Sproul) was idle during the year.

Bituminous coal was produced from three underground mines, two strip mines, and one auger mine.

The total output of clay (kaolin, fire clay, and miscellaneous clay) was lower than in the preceding year. Kaolin was produced by Grannas Bros. from the No. 1 mine near Williamsburg for use in manufacturing firebrick and block. Woodbury Clay Co. and Harbison-Walker Refractories Co. produced plastic fire clay at their Oreminea and Butler mines, respectively. Fire clays were used in manufacturing foundry refractories, firebrick, and block. Blair City Products, Inc. (Altoona), produced miscellaneous clay for making building brick. The Garfield Refractories Co. Cresson and Kittanning Point operations were not active in 1958.

Quicklime marketed for agricultural use was produced at a two-shaft kiln by Chimney Rocks Lime and Stone Co. (Hollidaysburg).

Bradford.—One strip coal mine was active.

Towanda Sand and Gravel Co., Inc., operating a fixed plant near Towanda, prepared paving sand and gravel for use by the State highway department and other users.

Bucks.—Despite a decline of nearly 2 million tons from the 5.3 million tons of sand and gravel produced in 1954, Bucks County remained the leading county in sand and gravel production. The Sand and Gravel Division of Warner Co. (Tullytown) was the principal producer in the State. Eight other companies produced sand and gravel from pits in Morrisville, Tullytown, New Hope, and Falls Township in the southeastern section of the county and at Riegelsville and Upper Black Eddy in the northern part of the county. Sand and gravel was processed for use as building and paving material and molding sand. A very small quantity of the total sand and gravel was sold or used as unprepared material. Shipments of sand and gravel by waterway exceeded the combined tonnage hauled by truck and rail.

Three operators of limestone quarries near New Hope, Buckingham, and Rushland produced crushed stone, solely for use as concrete aggregate and roadstone. Edward Karpinski (Langhorne) reported output of irregular-shaped dimension limestone for building material. Samuel M. Yoder Estate produced crushed redstone

and bluestone at the Blooming Glen quarry and crusher, and George Wiley crushed bluestone at Wiley's quarry near Point Pleasant. All the sandstone was sold for road material. George Wiley also produced crushed miscellaneous bluestone for road material. Six basalt quarries were operated in the county near Edison, east of Telford, Quakertown, east of Coopersburg, Langhorne, and Rushland. Both crushed and dimension stone was produced. The crushed material was sold or used as concrete aggregate and roadstone and the dimension stone sold chiefly for surface plates, monuments and mausoleums, and rough architectural stone.

Miscellaneous clay produced by Quakertown Brick & Tile Co., Inc., was used for building brick.

A quantity of sphalerite semiprecious stones was collected in the area near New Galena.

Vermiculite, imported from the Union of South Africa by Hyzer and Lewellen, was processed at the company Southampton plant. The exfoliated material was sold or used mainly for residential and refractory insulation.

Butler.—Bituminous coal was produced from 71 mines—38 strip mines, 31 underground mines, and 2 auger mines. Strip mining yielded 86 percent of output. At the 38 strip mines (7 less than in 1957) 49 power shovels and 33 draglines were used to produce 1.6 million tons. Sixteen cutting machines were used in the underground mines to cut 248,000 short tons of coal. Only 25 percent of the coal was mechanically cleaned, all by jigs.

Penn-Dixie Cement Corp. used captive crushed limestone for manufacturing cement at the West Winfield No. 9 plant. Types I–II, and Type III, air-entrained and non-air-entrained portland cement and some mortar cement were produced by the wet process.

Mercer Lime and Stone Co. produced quicklime and hydrated lime at its plant one-half mile west of Branchton. Quicklime marketed for chemical and industrial uses was the chief product. Hydrated lime for agricultural, chemical, and industrial uses was also produced and marketed.

Four companies produced and crushed limestone from quarries near Harrisville, Branchton, and West Winfield for use as concrete aggregate, roadstone, and blast-furnace flux and for manufacturing cement. One of the companies—Michigan Limestone Division, U. S. Steel Corp.—reported that operation of its Annandale mine near Boyers was discontinued in February. Quantities of roadstone were sold to local Government agencies.

Building sand and gravel was produced and prepared by H. W. Cooper and Highway Sand & Gravel Co., Inc. (both near Slippery Rock). Shipments to contractors and others was made by truck.

Scott Borland Brickyard (Mars) recovered shale from company-owned deposits near the plant site to manufacture building brick. Fire clay produced by Glenn R. Boosel was used as refractory mortar. Pittsburgh & Erie Coal Co. and Chutz Bros. reported no production in 1958.

Cambria.—A total of 131 mines was active, of which 109 were underground, 20 strip mines, and 2 auger. Production from underground mines totaled 7.8 million short tons, of which 7.7 million was mechanically cut and 7.5 mechanically loaded. Forty-one power

shovels and 13 draglines were used to produce 364,000 tons of strip coal. Seventy-four percent of the total production from all mines was mechanically loaded, and 74 percent was cleaned, using wet and pneumatic equipment.

Fire clay was produced from underground mines operated by Harbison-Walker Refractories Co. (Blandburgh) and Patton Clay Manufacturing Co. (Patton), and Hiram Swank's Sons, Inc. (South Fork). Triangle Clay Products Co. (Johnstown) recovered miscellaneous clay from an open pit. Fire clay was used for building brick, vitrified sewer pipe, glass refractories, and other refractories. The miscellaneous clay output was used for building brick. Inactive clay producers were Haws Refractories Co. and Red Ridge Coal Co.

Lanzendorfer Minerals Co. produced crude iron oxide pigments of the yellow sulfur-mud variety at its No. 31 mine near Nanty Glo. The material was sold for the manufacture of paint pigments.

Carbon.—Anthracite was mined from underground mines, strip pits, and culm banks. Leading producers of anthracite were: Coaldale Mining Co., Inc., Pollock Trucking Co., Glen Alden Corp., and Wat-Rap Coal Co.

Silica for making silica brick was recovered and crushed at the Little Gap quarry and plant near Palmerton by North American Refractories.

The Alliance Sand Co., Inc., processing only sand, ranked ninth in the State for total sand produced. Although a large quantity was used as building material, the sand produced also was employed as paving sand, fire or furnace sand, and engine sand. Four other companies produced smaller quantities of sand for paving and building use.

Carnotite and autunite gem stones were recovered near Jim Thorpe and Mauch Chunk.

Panther Valley Coal Co. Inc., gave up its lease and discontinued clay production.

Centre.—Centre County again led in lime output; however, both tonnage and value decreased considerably compared with 1957. The Standard Lime & Cement Co. (Pleasant Gap) and National Gypsum and Warner Co. (both of Bellefonte) produced quicklime and hydrated lime. The principal applications of lime were for metallurgy, miscellaneous chemical and other industrial uses, and the manufacture of paper.

Ninety-three percent of the production of bituminous coal came from 19 strip mines, 6 percent from 17 underground mines, and the rest from 2 auger mines. Of the 60,000-ton underground production, only 13,000 tons of coal was cut by machine and 2,000 tons hand loaded onto conveyors. Forty-six power shovels and 23 draglines were used to produce the strip-mined coal. Pneumatic methods were employed to clean a small quantity of coal.

Crushed and broken limestone was produced at six operations near Bellefonte, State College, Pleasant Gap, and Howard. The output was mainly for use in manufacturing lime and as concrete aggregate, roadstone, and blast-furnace and open-hearth flux. Neideigh Bros. Limestone Co., Inc. (State College), purchased larger hammermills and steel bins with new screens to increase production capacity.

With the closing of J. H. France Refractories Co. mine near Snow Shoe, Harbison-Walker Refractories Co. became the only active clay producer in the area. General Refractories had discontinued operation in 1957. Plastic fire clay produced was used in manufacturing firebrick and block.

Chester.—Crushed and broken limestone used principally as concrete aggregate and roadstone was produced by Bradford Hills Quarry, Inc. (Downington), and Warner Co. (Paoli). In addition, Valley Forge Stone Co. (Malvern) and Warner Co. (Devault) produced limestone for blast-furnace flux. Warner Co. also utilized crushed limestone at its Cedar Hollow plant (Devault), producing both quick and hydrated lime for sewage and trade-wastes treatment and agricultural use; and hydrated lime for building lime. The lime was shipped to various Northeastern States. All three companies sold roadstone to nearby government agencies. Dimension sandstone (bluestone) was quarried by Albert Rotunno, Rotunno quarry, and Abe Minor, Avon-Grove quarry (both near Avondale). Both companies sold or used the stone as rough construction stone, rubble, rough architectural stone, and flagging stone. John Fecondo & Sons (Avondale) quarried dimension sandstone for rough construction and rubble and a quantity of crushed stone.

Keystone Trappe Rock Co. (Glenmore) and V. DiFrancesco & Son (Devault) quarried and crushed basalt, principally for road material and railroad ballast. Both companies sold road material to local and State government agencies. French Creek Granite Co. produced dimension basalt (black diabase) from a quarry near St. Peters for rough and dressed architectural stone and surface plates. Some of the stone was used on the exterior of the Nassau County Court House, Garden City, Long Island, N. Y., and the City and Municipal Courts Building, New York, N. Y.

Chester County was one of the few counties not showing a decline in clay production during the year. Greater output of miscellaneous clay by McAvoy Vitrified Brick Co. (Phoenixville) explained the increase over the preceding year. The output was used for building brick.

A quantity of mineral specimens and some gem-quality stones were collected in various sections of the county. These stones included pyrite, magnetite, kyanite, garnet, quartz, and sphalerite.

Clarion.—Clarion County ranked second in strip mining of bituminous coal. Twenty-nine strip mines were active, producing 2.7 million tons of coal and using 75 power shovels and 35 draglines. Sixteen underground mines (1 less than was active in 1957) produced 79,000 tons of coal, of which 54,000 was cut by machines and 46,000 mechanically loaded. Forty percent of the total production was mechanically cleaned; 486,000 tons was wet-washed, using jigs, and 611,000 tons using other wet methods.

Clay production and value dropped 39 and 50 percent, respectively, from the preceding year. Plastic fire clay was produced by Harbison-Walker Refractories, Climax Fire Brick Co. (north of Climax), and New Bethlehem Tile Co. (New Bethlehem). Niles Fire Brick Division of Mexico Refractories Co., a previous large producer, did not report production from its underground mine near Lucinda. In addition to plastic fire clay, Climax Fire Brick Co.

produced flint fire clay, and New Bethlehem Tile Co. mined a miscellaneous clay. Producing only flint fire clay were: Frank Pope Co. (New Bethlehem), Lucinda Clay Co., and L. E. Eisworth. Fire clays were used in manufacturing firebrick and block, mortar for refineries, building brick, and other heavy clay products, whereas miscellaneous clay was used to make tile and building brick.

Clearfield.—Clearfield County was the leading county in the production of bituminous coal from strip mines in 1957. One hundred and nine strip mines were active, producing 4.2 million tons of coal, using 221 power shovels and 85 draglines. In all, 89 underground mines also were active in 1958, with a production of 1.3 million tons. Of the coal mined underground, 1.2 million tons was cut by machine, and 856,000 was mechanically loaded. Only 11 percent of the total coal produced in Clearfield was mechanically cleaned. A total of 6,000 tons was wet-washed, using jigs; 528,000, using other wet methods; and 82,000, using pneumatic methods.

Clearfield County was the leading producer of clays. Tonnage dropped 30 percent and value 24 percent compared with 1957. Fifteen companies reported clay-mining activity. Thirteen produced only fire clay; the other two produced both fire and miscellaneous clay. Nine companies reported output of plastic fire clay, three flint fire clay, and three both varieties of fire clay. Of the companies producing plastic fire clay only Hiram Swank's Sons, Inc., and Harbison-Walker Refractories Co. produced from underground mines. W. K. Turner & Sons, Artie K. Baughman, and Geynet Lansberry Coal Co. marketed their entire production of plastic fire clay. Plastic clay was used in manufacturing refractories and for heavy clay products. Flint fire clay was mined and consumed by the producer in manufacturing refractories; some was also sold in the open market. North American Refractories Co. and General Refractories Co. operated underground mines; others produced from open pits. Robinson Clay Product Co. and Williamsgrove Clay Products Co., Inc., operated open-pit mines, producing plastic fire clay and miscellaneous clay and shale for company use in making building brick and vitrified sewer pipe. A total of 11 inactive mines was reported by General Refractories, Harbison-Walker Refractories, and Laclede-Christy Co.

Clearfield Limestone Corp. produced paving gravel from a pit and stationary plant near Clearfield.

Harbison-Walker Refractories Co. (Clearfield) exfoliated vermiculite at its No. 2 works. The exfoliated vermiculite was used for manufacturing insulation brick. The company reported that manufacture of this product was discontinued during the year.

Clinton.—Bituminous coal was mined from seven strip and four underground mines. Fourteen power shovels and 7 draglines were used at the strip mines to produce 614,000 short tons of coal. Only 9 percent of the underground production was cut by machines, and only 20 percent of the total production from all mines was mechanically cleaned.

Lycoming Silica Sand Co. produced crushed and sized limestone at the Salona quarry and plant for use as concrete aggregate, roadstone, and railroad ballast. Some roadstone was sold to the Pennsylvania Department of Highways.

The Kelsey Mining Co. recovered diaspore-type fire clay from an open pit near Gallage and Pine Creek and sold it for manufacturing high alumina brick. Miscellaneous clay mined under contract for Mill Hall Clay Products, Inc., near Castanea was processed and used at the company plant at Mill Hall for producing heavy clay products.

Columbia.—Anthracite was mined from strip pits, underground mines, and culm banks. Leading producers were: Raven Run Coal Co., Locust Dale Mining & Contracting Co., Susquehanna Colliery (Division of the M. A. Hanna Co.), and Jeddo-Highland Coal Co.

Bloomsburg Sand & Gravel Co. produced sand and gravel for use as building material from a pit and fixed plant near Bloomsburg.

The Alliance Clay Product Co. recovered miscellaneous clay from property leased from Lloyd E. Eister. Output was used to produce drain tile and flue liners.

Crawford.—Structural and paving sand and gravel and gravel for fill were processed at five fixed plants near Cochranton, Saegertown, Conneaut Lake, and Titusville.

Cumberland.—Crushed limestone for use as road material was produced by Hempt Bros., Inc. (Camp Hill), and Valley Quarries (Shippensburg). In addition to roadstone, Locust Point Stone Quarries (Mechanicsburg) produced agricultural limestone.

Three companies, two of which operated stationary plants near Mount Holly Springs and the other a fixed plant near Walnut Bottom, produced building and paving sands and other gravel to supply the needs of contractors and local business.

Kaolin used to produce portland and other hydraulic cements was recovered by Philadelphia Clay Co. from an open pit near Mount Holly Springs.

Gem stones were collected near Mount Holly Springs.

Dauphin.—Three companies reported output of limestone crushed at local plants near Swatara, Harrisburg, and Steelton. Chief uses of the stone were blast-furnace flux, concrete aggregate, roadstone, and the manufacture of cement. Hoffman Bros. & Wilson, Inc., sold the equipment and stockpiles at its Elder Quarry and plant near Harrisburg to Hempt Bros., Inc., in May. Faylor Lime & Stone Co. produced crushed basalt at a quarry and plant near Elizabethville solely for use as road material.

Anthracite was mined principally from underground mines with smaller quantities from strip pits and culm banks.

Miscellaneous clay recovered by Bethlehem Limestone Co. at its Steelton quarry was used in making foundry refractories and protective coating for pipes. Two divisions of Glen-Gery Shale Brick Corp. produced and used miscellaneous clay from open pits in Harrisburg and Middletown to manufacture building brick.

Paving sand and gravel produced by Highspire Sand & Gravel Co., Ltd. (Highspire), and Pennsylvania Supply Co. (Amity Hall) was washed, screened or otherwise prepared before delivery by motor truck. Dauphin County was one of only two counties reporting Government-and-contractor operations during the year.

H. E. Millard Lime & Stone Co., at its plant near Hershey, operated eight shaft kilns and one continuous hydrator to produce

hydrated lime for agricultural use and quicklime for use in open-hearth furnaces.

Delaware.—Media Quarry Co. (Media) produced irregular-shaped dimension sandstone for construction. Some of the stone was used as face stone on a dormitory at Swarthmore College, Swarthmore, Pa. V. DiFrancesco & Son (Llanerch) and General Crushed Stone Co. (Glen Mills) produced and crushed basalt for use as concrete aggregate, roadstone, and railroad ballast. The General Crushed Stone Co. acquired a new asphalt-mixing plant, with a 2½-ton mixer capacity. Delaware County was the only source of granite in the State. F. Cantono & Sons Foxcroft quarry (Broomall) quarried dimension granite for rough architectural stone and rubble. Stone from this quarry was used on the exterior of Rosemont College (Rosemont) and Chestnut Hill Hospital (Philadelphia). The Lima Building Stone Co., Inc. (Lima), quarried irregular-shaped dimension granite as construction stone. Dimension miscellaneous stone as rough and dressed building stone was produced by Carl Galantino (Media).

Garnet, apatite crystals, and various other semiprecious stones were collected by hobbyists in the areas near Media, Mineral Hill, and Avondale.

Perlite, expanded at the Primos plant by Perlite Products Corp., was marketed principally as a building-plaster aggregate and as a mix with asphalt for insulating material.

Elk.—A total of 27 mines were active, of which 16 were underground, 8 strip, and 3 auger mines. Slightly more coal was produced from the strip than from underground mines. Of the coal mined underground, 142,000 tons was cut by machine, and 113,000 was mechanically loaded. Eleven power shovels and 5 draglines were used at the eight strip mines. Only 7 percent of the production from all mines was mechanically loaded.

St. Mary's Sewer Pipe Co. remained the only active clay producer mining miscellaneous clay at North Point for sewer pipe. Meyer Clay Mine did not operate.

Stone Haven Mix, operating a portable plant near Johnsonburg, produced paving gravel for use on roads by local and State highway crews.

William DeSalve recovered sulfur mud from the Brandy Camp mine (near Caledonia), which was sold for use in manufacturing paint pigments.

Erie.—The combined output of sand and gravel by four companies operating stationary plants near Fairview, Lake City, Springfield, and Erie remained virtually unchanged from 1957.

Corry Peat Products Co. recovered reed-sedge and humus peat from a bog near Corry.

Fayette.—A total of 56 mines were active in 1958, including 35 underground, 30 strip, and 1 auger. Forty-nine cutting machines were used to undercut 99 percent of the underground production. Thirty-two percent of the total bituminous coal produced in the county was mechanically cleaned, usings jigs and pneumatic methods.

Vesco Corp. produced and crushed limestone for use as road material, as rock dust for coal mines, and for agricultural purposes at the Lake Lynn quarry and plant near Mercersburg. Connellsville

Bluestone Co. quarried and crushed sandstone solely for road material and sold some to local and State government agencies for road construction. General Refractories Co. produced crushed silica at the Childs quarry and plant (Layton) for making silica brick.

The combined clay output of four companies dropped 43 percent below the previous year. Both Big Savage Refractories Division of Mexico Refractories Co. and Robert N. Matthews produced plastic-and flint-type fire clay at their Ohiopyle strip and Getteny strip operations, respectively. Plastic fire clay was also produced by Harbison-Walker Refractories Co. at its Smith mine near Ohiopyle. Fire clay mined was used for manufacturing firebrick and block. Layton Fire Clay Co. produced miscellaneous clay for building brick from an open-pit mine.

McClain Sand Co., operating a dredge near Point Marion, transported a large portion of its prepared building and paving sand and gravel by barge. The remainder was shipped by truck and rail.

Forest.—Tionesta Sand & Gravel, Inc., prepared sand and gravel at its plant near Tionesta.

Franklin.—Crushed limestone for use as concrete aggregate, roadstone, and railroad ballast and for agricultural purposes was reported by six companies operating seven quarries. Quarries were active near Orrstown, Dry Run, Williamson, Shippensburg, Chambersburg, Mercersburg, and Zullinger.

Building sand was screened or otherwise prepared from sand recovered by Mount Cydonia Sand Co., Inc. (Chambersburg), and Caledonia Sand Co. (Fayetteville).

Frank L. Heinbaugh produced and sold quicklime for agricultural use at its Mercersburg plant, using three shaft kilns. Bituminous coal was used as a fuel.

Fulton.—H. B. Mellot Estate, Inc., produced limestone at the Charleston quarry (Warfordsburg) and the Morton Quarry (Big Cove Tannery). The stone was crushed at local plants for use as concrete aggregate, and roadstone and for agricultural purposes. John P. Martz & Son produced and crushed limestone solely for use in manufacturing lime at the Martz Draw Kiln (Hustontown). The lime produced by this company was marketed in Pennsylvania as agricultural lime. Most of the limestone produced in the county was sold to local government agencies for road construction.

H. B. Mellot Estate, Inc., operating a stationary plant near Warfordsburg, supplied consumers with prepared structural and paving sands.

Greene.—Greene County ranked second in the production of bituminous coal from underground mines, with 22 underground mines active. Of the 9.7 million tons of coal mined underground, all but a small fraction was cut by machine and mechanically loaded. A small tonnage was produced at three strip mines. Of the county coal production, 72 percent was mechanically cleaned, using jigs and pneumatic and other wet methods.

Huntingdon.—Huntingdon County continued to be the chief source of specialized sands. In addition to glass, molding, and engine sands, a variety of ground sands and those for other industrial uses was prepared by Pennsylvania Glass Sand at its Keystone Works near Mapleton Depot. Alexandria Fire Clay Co. (Alexandria) and

Warrior Ridge Sand Co. (Huntingdon) produced fire and furnace sand and building sand, respectively. Method of transportation from plants was by railroad and truck.

Three companies quarried and crushed limestone, chiefly as concrete aggregate, roadstone, and railroad ballast and for agricultural uses. Producers were New Enterprise Stone & Lime Co. (New McConnellstown); Tyrone Lime & Stone Co., Stover No. 1 quarry (Tyrone); and Warner Co. (Bellefonte Division), Union Furnace quarry (Union Furnace). Harbison-Walker Refractories Co. (Mount Union) and North American Refractories Co. (Three springs) quarried and crushed silica for making silica brick.

Seven underground and four strip mines, two and one less, respectively, than 1957, produced 45,000 short tons of coal in all. Only 29 percent of the underground tonnage was cut by machines; 6 percent was mechanically loaded. Three power shovels and two draglines were used at the four strip mines.

Alexandria Fire Clay Co. did not operate its mine but sold plastic clay from stock for refractory mortar.

Indiana.—Production from 84 underground coal mines totaled 4.7 million short tons, 4.5 of which was mechanically loaded; virtually all was cut by machine. Production at the 30 strip mines totaled 944,000 tons. Fifty-three power shovels and 24 draglines were used in stripping overburden and loading coal. Over 31,000 tons of coal was produced from five auger mines. Of total production, 68 percent (3.9 million tons) was mechanically cleaned, using jigs, other wet methods, and pneumatic methods.

Plastic fire clay was produced from Swank No. 6 underground mine near Clymer by Hiram Swank's Sons, Inc., and used to make pouring pit refractories.

Jefferson.—Bituminous coal was produced from 39 underground mines, 30 strip mines, and 3 auger mines. Ninety percent of the underground production was cut by machine, using 47 cutting machines, and 74 percent of this production was mechanically loaded. Fifty-three power shovels and 16 draglines produced 902,000 short tons of coal. Production from auger mines totaled over 26,000 tons.

The Brockway Clay Co. and Hanley Co. produced and used plastic fire clay to manufacture building brick, tile, vitrified sewer pipe, flue lining, and other heavy clay products. Henry O'Neill & Co. sold plastic fire clay produced from an underground mine near Brookville for refractory use.

Juniata.—Limestone quarried and crushed at local plants by Juniata Limestone Co. (McAllisterville, Fayette Township) and W. N. Quigley (Mifflintown) was used mainly for concrete aggregate and roadstone. Juniata Limestone Co. added a hammermill with double-deck screen and electric power. Some of the stone was sold to local government agencies for road construction. Silica quarried and crushed at the Van Dyke plant near Thompsontown by National Refractories Division, Mexico Refractories Co., was utilized at the company plant to manufacture silica brick.

Lackawanna.—Production of anthracite decreased considerably compared with 1957, but the county continued to rank fourth in tonnage and value. Anthracite was mined at underground mines, strip pits, and culm banks. Leading producers were: Hudson Coal Co.,

Moffat Coal Co., Inc., Diamond Colliery Co., Village Slope Coal Co., and Turnpike Coal Co.

Lancaster.—Twelve companies recovered limestone from 15 quarries. Leading producers were D. M. Stoltzfus & Son, Inc., operating three quarries, two near Talmage, and one near Quarryville, and Ivan M. Martin, Inc., Blue Ball. Major production was from quarries near Denver, Talmage, Blue Ball, Bareville, and Martindale. The principal uses of the limestone were as concrete aggregate and roadstone and for agricultural purposes. A quantity of irregular-shaped dimension limestone also was produced. Quantities of stone were sold to local State and government agencies as well as government agencies in Delaware and Maryland. Several companies reported improvements at their operations: David M. Burkholder (Martindale) installed conveyor belts in place of chain elevators to the secondary crusher; A. G. Kurtz & Sons, Inc., added a secondary crushing mill; and J. Miller Eshelman & Son, Inc. (near Salunga) constructed a new plant.

Anthracite was recovered from dredging operations only.

Sand processed by Hempt Bros. (Elizabethtown) and Milton Grove Sand, Inc. (Milton Grove), was used as building and paving material. A. T. Harris Sand Co. (Honey Brook) processed sand for fire and furnace use. Trucks and railroads were used to transport sand to consumers.

Miscellaneous clay and shale for building brick were mined and consumed by Lancaster Brick Co. (Lancaster) and Glen-Gery Shale Brick Corp. (Ephrata). A. G. Kurtz & Sons, Inc., sold the clay output recovered from its limestone quarry also for building brick. Whitaker Clay Co. (Narvon) produced fire clay for foundries and steelwork.

Amos K. Stoltzfus produced hydrated lime, chiefly for agricultural use, at a plant 2 miles west of Morgantown. J. E. Baker Co. did not operate its Billmeyer lime plant near Bainbridge.

Mineral specimens and gem-quality stones were collected in the county near Blue Ball, Wakefield, and Neffsville. Included among these specimens and stones were pyrite, chromite, calcite, malachite, marcasite, and hematite.

Lawrence.—In production and value Lawrence County ranked third in the State as a stone-producing area. Five companies produced and crushed limestone and cement rock, principally for use as blast-furnace and open-hearth flux, concrete aggregate, and roadstone and for manufacturing cement. The stone was recovered from quarries near New Castle, Bessemer, Hillsville, Mahoning Township, and Wampum. The major portion of the stone was transported by railroad. Two companies utilized the major portion of the limestone and cement rock produced for manufacturing cement. Medusa Portland Cement Co. (Wampum) produced Types I–II, Type III, portland, and masonry cements. This company changed over to two larger capacity kilns to replace five smaller obsolete kilns. Bessemer Limestone & Cement Co. (Bessemer), operating four kilns, produced mostly Types I–II, air-entrained and non-air-entrained, and Type III non-air-entrained cement and "Bessemer" mortar.

Twenty-four strip mines and two underground mines were active. Thirty-three power shovels and 21 draglines were used at the strip mines to produce 1 million short tons of coal. None of the coal produced was mechanically cleaned.

Fenati Brick Co., Inc. (New Castle), and Metropolitan Brick, Inc. (Bessemer), produced both plastic fire clay and miscellaneous clay for their own use. Fire clay mined and hauled under contract for Natco Corp. was used at their East Palestine, Ohio, plant. Keystone Loam & Clay Co. produced clay for foundry and steel-mill use. During the year Fenati Brick Co. constructed a two-story building housing a laboratory and storeroom adjacent to its yard office.

Superior Sand & Supply Co. recovered paving sand and gravel at its New Castle plant. Mahoning Valley Sand Co. (Taylor Township) produced building and paving sand and gravel.

D. M. Boyd and Moores Peat Humus Co. (both near New Wilmington) recovered humus-type peat from bogs.

Lebanon.—Bethlehem Cornwall Corp., a subsidiary of Bethlehem Steel Co., operated the Cornwall underground mine 5 miles south of Lebanon, mining crude ore by 99 percent block caving and 1 percent open stope. The ore was processed at the company Lebanon concentrator, using magnetic separators and flotation. Sinter and pellet were shipped from the Lebanon concentrator to Steelton, Md.; pyrite concentrate to Sparrows Point, Md.; and copper concentrate to Laurel Hill, N. Y.

North American Refractories reported a quantity of silica for making silica brick from the Womelsdorf quarry. H. E. Millard Lime & Stone Co. operated a lime plant at Annville, using four rotary kilns and one continuous hydrator. Quick and hydrated lime was marketed, chiefly for open-hearth furnaces, water purification, and building lime.

The principal uses of limestone quarried and crushed in Lebanon County were as concrete aggregate, roadstone, blast-furnace and open-hearth flux, and cement and lime manufacture. Leading producers were H. E. Millard Lime & Stone Co. (Annville) and Calcite Quarry Corp. (Cornwall). Quantities of stone were sold to various government agencies for road construction.

Dredging was the only method used to recover anthracite in Lebanon County.

Some gem stones and mineral specimens (serpentine, apophyllite, hematite, and magnetite) were collected near Cornwall.

Lehigh.—Shipments of portland and masonry cements continued to decrease. Coplay Cement Manufacturing Co. (Coplay), The Whitehall Cement Manufacturing Co. (Cementon), Lehigh Portland Cement Co. (Fogelsville and Ormrod), and Giant Portland Cement Co. (Egypt) quarried limestone or cement rock and manufactured cement. The principal types of cement shipped were Types I–II, Type III, air-entrained and non-air-entrained and some mortar cement. The Whitehall Cement Manufacturing Co. acquired a new packing house and two new grinding mills. The Lehigh Portland Cement Co. announced plans for a $2 million dust-control program at its Fogelsville plant. Electrostatic precipitators will be installed to catch dust from kilns, and mechanical bag collectors will be used

to capture dust from stone driers. Several companies were inactive for approximately 2 months due to decreased demand.

New Jersey Zinc Co. mined crude ore for recovering zinc at an underground mine near Friedensville by the open-stope method.

Lehigh Stone Co. (Ormrod) produced crushed limestone for use as concrete aggregate and road material. A quantity was sold to various local and State government agencies. Susquehanna Quarry Co. (Alburtis) quarried and crushed sandstone as road material.

Penn Big Bed Slate Co., Inc., produced slate at its quarry and plant near Slatedale. The slate was processed and sold for various uses but primarily for structural purposes, blackboards and bulletin boards, and roofing. Robert A. Reichard, Inc. (Allentown), reported it no longer crushes oystershell.

Quartz crystals, jasper, sphalerite, unakite, and various other semiprecious stones and mineral specimens were collected near Vera Cruz, Friedensville, and Lehigh Valley.

Crude perlite from mines in Nevada and New Mexico was expanded by Pennsylvania Perlite Corp. at its Allentown plant.

Luzerne.—Luzerne County accounted for 32 percent of anthracite production. Anthracite was mined from underground mines, strip pits, and culm banks. Leading producers were: Glen Alden Corp., Hudson Coal Co., Lehigh Valley Coal Co., and Jeddo-Highland Coal Co. Four companies operating fixed plants sold building and paving sand and gravel under contract to local Government agencies near West Wyoming, Drums, Avoca, and Forty Fort. Coon Certified Concrete (Sweet Valley), North Mountain quarry, General Crushed Stone Co. (White Haven) White Haven quarry, and American Asphalt Paving Co. (Trucksville) produced and crushed sandstone, chiefly for use as concrete aggregate and roadstone. Some of the stone was sold to local and State government agencies for road construction. Hayes Bros. Stone Co. (White Haven) produced dimension sandstone for rough construction, dressed architecture, and flagging. Humus and reed-sedge peat was recovered from bogs near White Haven by Blue Ridge Soil Pep Co. and Pennsylvania Peat Moss, Inc. Miscellaneous clay for building brick was mined by Hazelton Brick Co. Output was less than in 1957. Some mineral specimens (biotite and siderite) were collected.

Lycoming.—Lycoming Silica Sand Co. produced limestone from the Lime Bluff quarry near Muncy and the Pine Bluff quarry near Jersey Shore. The output was crushed and sized at local plants for use as road material and for agricultural purposes. Susquehanna Quarry Co. crushed limestone for road material from a quarry near Jersey Shore. Both companies sold stone to local and State government agencies. John T. Morgan (Slate Run) quarried dimension sandstone as flagging stone. Miscellaneous dimension stone for rubble and flagging use was mined by Callahan & Haines Stone Co. (Slate Run). Keystone Filler & Manufacturing Co. produced crushed and ground slate as flour at the Sheddy quarry and plant near Muncy. The combined production of J. A. Eck & Sons, Inc., and Lycoming Silica Sand Co. in the Montoursville area placed Lycoming County third in total sand and gravel output.

Bituminous coal was produced from three underground and two strip mines. At the underground mines (one less than 1957) 17,600

short tons was produced by hand methods. Three power shovels and two draglines were used to produce 35,000 tons of strip-mined coal. Tripoli was mined by Penn Paint & Filler Co. from the Ramsey quarry near Antes Fort and by Keystone Filler & Manufacturing Co. (Muncy). The rottenstone was crushed, dried, and ground for use as an abrasive and filler.

McKean.—C. L. McGavern, Jr., produced molding sand from a pit at Eldred. Plastic fire clay recovered by Kaul Clay Products Co. near Clermont was used for vitrified sewer pipe and hot tops for the steel industry. Kness Bros. produced two types of fire clay (plastic and burley) for use in foundries and steel mills. Floor and wall tile and building brick were manufactured from shale produced by Hanley Co. near Lewis Run. Three strip mines produced 47,000 short tons of coal. Each mine used one power shovel to strip the coal. None of the coal produced was mechanically cleaned.

Mercer.—Ninety-three percent of the bituminous coal production came from eight strip mines (one less than in 1957). The remainder came from three underground mines. All underground tonnage was cut by machine, and 26 percent was mechanically loaded. Twelve power shovels and 8 draglines were used at the eight strip mines to produce 582,000 tons of coal. None of the coal produced was mechanically cleaned. The sand and gravel industry, keeping pace with the economic growth of industry in the county, reported sizable gains in output over previous years. The increase raised the county to second place in the State as a producer of sand and gravel in western Pennsylvania. Seger Sand & Gravel (West Middlesex), Seidle Sand & Gravel Co. (Mercer), and Transfer Sand & Gravel Co. (South Pymatuning Trap) processed building and paving sand and gravel and fire sand. Trucks transported materials to consumers. White Rock Silica Sand Co. (Greenville) quarried and crushed silica, mainly for use in foundries and steel mills and as road material. Welty M. Smeltzer recovered a quantity of dimension sandstone from the Rock Kastle quarry (north of Volant) for use as dressed or cut architectural stone. A quantity of peat was recovered from bogs in the county.

Mifflin.—Industrial sand produced by Pennsylvania Glass Sand Corp. at its McVeytown plant was sold and used as glass-molding, grinding, polishing, and engine sands and for other miscellaneous uses. In addition to molding and engine sand, Miller Silica Sand Co. (Burnham), along with James R. Kline's Sons (Lewistown), processed structural sand. Railroad and trucks transported material from the plants. Bethlehem Limestone Co. operated the Naginey quarry near Milroy and crushed the limestone, principally for use as concrete aggregate, roadstone, blast-furnace flux, and stone sand. Honey Creek Lime Co. (Reedsville) and Ehrenzeller Limestone Co. (McVeytown) produced and crushed limestone for lime manufacture. Honey Creek Lime Co. produced some quicklime for agricultural use and hydrated lime for refractory material at the Reedsville lime plant by using 10 pot kilns and 1 continuous hydrator. Quicklime produced at the Ehrenzeller Lime Co. plant (McVeytown), using seven draw kilns, was marketed for agricultural use. Quartzite from the Hawstone quarry by Haws Refrac-

tories Co. was crushed and utilized at the local company plant for manufacturing silica brick.

Monroe.—Hamilton Stone Co. (Bossardville) quarried and crushed limestone at a local plant for use as asphalt fill and in lime manufacture. Some of the stone was sold under contract to the Pennsylvania Department of Highways. Building and paving sand and gravel and sand for beaches were prepared at stationary plants operated by Coolbaugh Sand & Stone, Inc. (Gouldsboro), Sheesley Minerals, Inc. (Kunkletown), and Steward White & Clyde White (Stroudsburg). Monroe County was the main source of mineral specimens and gem stones collected in the State. Specimens collected near Stroudsburg and Kresgeville were quartz crystals, and pyrolusite.

Montgomery.—Montgomery County ranked second in production and value among the stone-producing counties. Quick and hydrated lime produced at the company Plymouth Meeting plant by G. & W. H. Corson, Inc., was sold and used principally as building lime. Operation at the plant consisted of six shaft kilns and three continuous hydrators, natural gas was used as fuel. Five companies operating quarries near Norristown, Conshohocken, West Conshohocken, Bridgeport, and Plymouth Meeting produced limestone, chiefly as concrete aggregate, roadstone, and blast-furnace and open-hearth flux, and for cement and lime manufacture and agricultural purposes. Two leading producers were G. & W. H. Corson, Inc. (Plymouth Meeting), and Bethlehem Limestone Co. (Bridgeport). The latter company replaced a hammermill crusher with an Allis-Chalmers crusher at its operation. Fire Stone Products Co. (Glenside) produced dimension quartzite for rough architectural blocks and a quantity of crushed stone for steel-furnace or converter lining. William Bambi & Sons, Inc. (Norristown), produced dimension sandstone for use as rough building stone. R. K. Kibblehouse (Perkiomenville) installed a new crusher at its quarry operation and produced crushed basalt for road material. Montgomery Stone Co., Inc. (Montgomeryville), quarried dimension basalt as dressed building stone and crushed and broken stone for road material. Miscellaneous stone (argillite) was mined at Harleysville by M. & M. Stone Co. and crushed for road material. A. Manero & Sons (Glenside) produced miscellaneous dimension stone for use as rough and dressed construction stone.

Allentown Portland Cement Co. produced limestone and cement rock at its No. 2 quarry for use in the manufacture of cement. Types I–II–III air-entrained and non-air-entrained portland cement and some mortar cement were produced, using three kilns, at the West Conshohocken plant.

Total clay output declined 29 percent. The Robinson Clay Product Co. produced both fire clay and miscellaneous clay at Pottstown, using the clay to make vitrified sewer pipe. Other companies producing only miscellaneous clay for building brick and flowerpots were: Lansdale Brick Products Co. (Landsdale), Harry R. Shaffer (Trappe), The Keller-Whilldin Pottery Co. (North Wales), and Norristown Brick Co. (Norristown).

William Bambi & Sons, Inc. (Norristown), recovered sand for building purposes at its pit and local plant. Gem stones and mineral specimens were collected by individuals, primarily as a hobby.

Calcite, sphalerite, zeolite, quartz crystals, and galena were among the various specimens collected near Bridgeport, Phoenixville, Perkiomenville, and various other locations.

The Philip Carey Manufacturing Co. (Plymouth Meeting) and Refractory & Insulation Corp. (Port Kennedy) expanded crude perlite at company expanding plants. The expanded material was marketed for use as filler in refractory materials.

Montour.—Crushed and sized limestone was produced at a quarry and plant east of Milton by Lycoming Silica Sand Co. for use as road material and for agricultural purposes. Limestone for use as concrete aggregate and roadstone was recovered from a quarry near Danville by Mausdale Quarry Co. Both companies sold road material to nearby government agencies.

Northampton.—Although shipments of portland and masonry cements decreased 33 percent and value 17 percent compared with 1957, Northampton remained the leading cement-producing county in the State. Ten companies operated 11 plants for manufacturing cements from limestone and cement rock, either purchased or produced at local company quarries. Plants were at Nazareth, Bath, Northampton, Martin's Creek, Stockertown, Sandts Eddy, and Bethlehem. Output of cement was comprised of Types I–II air-entrained and non-air-entrained portland, white portland, and some mortar.

Owing to the inclusion of slate production with stone in 1958, Northampton County became the leading stone-producing area in the State. Compared with 1957, the output of each commodity group decreased. Eleven active producers reported an output of limestone and cement rock from 12 quarries. The leading producers were: Penn-Dixie Cement Corp. (Plant No. 4 at Nazareth and Plant No. 6 at Penn Allen), Bethlehem Steel Co. (Bethlehem), Keystone Portland Cement Co. (Bath), and Dragon Cement Co., Inc. (Northampton). Other operations were scattered throughout the county near Martin's Creek, Stockertown, and Sandts Eddy. Most of the limestone and cement rock were utilized at company plants to manufacture cement or crushed and sold as concrete aggregate and roadstone. Quantities of the roadstone were sold to local and State government agencies. Twelve companies reported an output of slate in the county; 11 were active producers, and 1 sold from its stockpile. Slate was recovered from various locations in the county: Six at Pen Argyl; two each at Windgap and Bangor, and one each at East Bangor and Bath. The principal uses of the processed slate were for blackboards and bulletin boards, roofing slate, structural and sanitary, and flagging stone. Value-wise, the five leading producers were D. Stoddard & Sons, Inc., Stephens-Jackson Co., Anthony Dally & Sons, Inc., Parsons Bros. Slate Co., and Diamond Slate Co. Several companies exported slate to Canada. Owing to lack of demand for its products, the American Bangor Slate Co., Inc. (Bangor), suspended operation in December 1957. General Slate Co. (Windgap) also ceased operation of its quarry in early 1958.

The combined output of structural and paving sand and gravel prepared by Houdaille Construction Materials, Inc. (Portland), and W. J. Lowe & Sons (Bangor) was transported to consumers by truck. Dredging was the only method used for recovering anthracite in the

county. Gummite, limonite, talc, graphite, molybdenite, and several other gem stones and mineral specimens were found near Easton and Hellertown by stone collectors as a hobby.

Northumberland.—Northumberland continued to rank third among the anthracite-producing counties, although output decreased 23 percent and value 26 percent compared with 1957. Underground mines and strip pits yielded the major portion of anthracite, with smaller quantities from culm banks. The principal producers were: Reading Anthracite Co., Susquehanna Collieries Division of The M. A. Hanna Co., Sayre Contracting Co., and Stevens Coal Co. Glen-Gery Shale Brick Corp., Watsontown Brick Co., and Watsontown Mineral Products Co. recovered miscellaneous clay from open pits near Watsontown for use in making building brick and as a filler in linoleum and phonograph records. Crushed and sized limestone as concrete aggregate and roadstone and for agricultural purposes was produced at Meckley's quarry and plant near Herndon by Eugene Meckley. Some of the road material was sold under contract to local government agencies. Susquehanna Quarry Co. (Dalmatia) quarried and crushed sandstone for road material. Molding sand recovered by M. E. Wallace Co. near Riverside and building and fill sand produced by Wilson's Sand Plant were shipped by railroad and trucks. Agricultural lime was produced and marketed by Clyde Starook (Northumberland) operating a one-pot kiln and using anthracite as fuel.

Perry.—Bradford Hills Quarry, Inc. (Newport), quarried and crushed limestone at its local plant for use as road material. Some of the stone was sold to local government agencies for road construction. A small quantity of gem stones was found near Landisberg.

Philadelphia.—The Liberty Corp., with dredging operations near Philadelphia, recovered and processed building sand and gravel. Shipments to consumers were made by barge. Although its output was slightly below that in the preceding year, The Liberty Corp. ranked as the fourth-ranking producer in the State.

Potter.—Dimension sandstone, for use as rough construction stone, rough architectural blocks, and flagging stone, was quarried at Wharton by Penn Kress Flagstone Co., Inc.

Schuylkill.—Schuylkill County ranked first in output of anthracite, producing 38 percent of the State total tonnage and 37 percent of the total value. Underground mines, strip pits, and culm banks were operated during the year. The five leading producers were: Reading Anthracite Co., Coaldale Mining Co., Inc., Gilberton Coal Co., Newkirk Mining Co., and Valley Stripping Co.

Limestone, used entirely as concrete aggregate and roadstone, was quarried and crushed at the Andreas quarry and plant by Huss Contracting Co. The Andreas quarry, operated by Harbison-Walker Refractories, yielded quartzite that was crushed and ground for manufacturing silica brick. Refractory Sand Co., Inc., operating a fixed plant near Andreas, was the leading producer of fire and furnace sand in the State. Sand for use in paving also was produced.

The output of miscellaneous clay by Auburn Brick Co. and Coaldale Mining Co., Inc., was 15 percent greater than in 1957. Clay mined by Auburn Brick Co. was used at a local plant for building brick, whereas clay mined by Coaldale Mining Co., Inc., was sold for use in making lightweight aggregate. Calcite, quartz, siderite,

pyrite, and several other minerals were found near St. Clair and south of Berwick.

Snyder.—Paxton Brick Co. (Paxtonville) and Glen-Gery Shale Brick Corp. produced miscellaneous clay and shale for making building brick.

Anthracite was produced by dredging.

National Limestone Quarry (near Paxtonville) quarried and crushed limestone for road material and agricultural use. Carton L. Comfort crushed limestone at a local plant for manufacturing agricultural lime. "Lump" lime and quick lime from four pot kilns were sold and delivered to farmers in the State. Coal was used to burn the lime.

Somerset.—Somerset County led in the number of active underground bituminous coal mines, having 115. Underground production totaled 1.6 million short tons of coal, of which 1.3 million was cut by machine and 749,000 mechanically loaded. Eighty-seven power shovels and 33 draglines were used to produce 1.2 million tons of strip-mined coal at the 59 active mines. Three auger mines also were active in 1958. Twenty-five percent of the total county production was mechanically cleaned—77,000 tons by jigs, 480,000 by other wet methods, and 160,000 by pneumatic methods.

General Refractories Co. produced flint fire clay from both underground and open-pit operations at Fort Hill for firebrick and block. Hiram Swank's Sons, Inc. (Holsopple), Harbison-Walker Refractories Co. (Garret mine), and Otto Brick & Tile Works (Springs) recovered plastic-type fire clay for manufacturing refractories such as sleeves, nozzles, stoppers, firebrick and block, and heavy clay products, such as building brick and tile. W. S. Compton Brick Co., Inc. (Salisbury) and Louis M. Weld (Myersdale) were inactive during the year.

Keystone Lime Co. (Springs) quarried and crushed limestone at its local plant as concrete aggregate, and roadstone and for agricultural use. The company built a new crushing unit for roadstone at its original plant. Somerset Limestone Co., Inc. (Bakersville), quarried and crushed limestone, solely as road material.

Small quantities of sand for various uses were produced by Boswell Sand Co. and Robert D. Shaulis, both of Boswell.

Sullivan.—Anthracite, the only mineral produced in the county, was mined from an underground mine, a strip pit, and culm banks. The leading producer of anthracite was Bliss Coal Co., operator of the Bliss strip mine.

Susquehanna.—Six of the seven sandstone-producing companies in the county reported output of dimension stone (mostly bluestone), chiefly as flagging stone and some for rough construction. Quarries were near Lakeside, Lenoxville, Rural, Brooklyn Township, and Harford. Crushed sandstone for road material was recovered from Bennett's quarry near Clifford by Keelor Supply Co., Inc. Some of the stone was sold to contractors and various State and government agencies.

Tioga.—There were five underground coal mines compared with seven in 1957 and three strip mines compared with five in 1957. Fourteen power shovels and three draglines were used to produce strip-mined

coal. None of the underground tonnage was cut by machine, mechanically loaded or mechanically cleaned by jigs.

Union.—Faylor Lime & Stone Co. produced and crushed limestone for road material and agricultural use at its quarry and plant near Winfield. John L. Iddings quarried and crushed limestone for road material. The company installed an impeller-type primary crusher. Most of the stone was sold to local government agencies for road construction.

Venango.—Fourteen strip mines (4 more than were active in 1957) produced. Twenty power shovels and 13 draglines were used at the strip mines. Forty-six percent of the coal was mechanically cleaned.

Sand for industrial uses was produced near Utica by Industrial Silica Corp. Material recovered by dredge and processed at a fixed plant enabled the Oil City Sand & Gravel Co. (Oil City) to supply the demands for building and paving sand and gravel required by an accelerated Federal and State highway program.

Warren.—General Concrete Products Corp. washed, screened, or otherwise prepared building and paving sand and gravel obtained from its dredging operation near Starbrick.

Washington.—Washington County was the leading county in total output of bituminous coal. Twenty-four underground mines were active, producing a total 9.5 million tons, most of which was cut by machines and mechanically loaded. Forty-six power shovels and 8 draglines were used at the 25 strip mines to produce 1.2 million tons. Ninety-eight percent of the coal produced was mechanically cleaned; 1.5 million tons was wetwashed, using jigs, and 8.9 million tons, using other wet methods. Coal was also produced from one auger mine.

Three companies—Donley Brick Co. (Washington), Monongahela Clay Products Co. (Monongahela), and Westmoreland Clay Products Co. (Washington)—made building brick from miscellaneous clay produced at local open pits.

Wayne.—Wayne Concrete & Sand Works, Inc. (Lake Ariel), produced and crushed sandstone for concrete aggregate and roadstone. The company acquired the A. W. Hindman plant at Damascus but did not plan to resume operations until 1959. W. R. Strong & Son and Paul Thompkins Estate produced dimension sandstone, chiefly for use as flagging stone and dressed or cut architectural stone. Three companies (two operating near Lake Ariel and the other near Tanners Falls) supplied building and paving sand and gravel.

Westmoreland.—Sixty-six (2 more than in 1957) underground mines, 17 (18 less than in 1957) strip mines, and 1 (1 less than in 1957) auger mine were active. Production from underground mines totaled 3.4 million short tons of coal, of which 3.3 million was mechanically loaded. A total of 22 power shovels and 2 draglines were used at the strip mines to produce strip-mined coal. Sixty-eight percent of the coal produced was mechanically cleaned; 484,000 wet-washed with jigs and 1.6 million with other wet methods; and 348,000 with pneumatic methods.

Dimension sandstone as rubble in retaining walls and flagging stone was quarried by Ray Branthoover (Smithton). John C. Beaumont (Smithton) reported output of dimension sandstone for use as rubble. Eidemiller Enterprises, Inc. (near Whitney), recovered

and crushed sandstone at the Blue Rock quarry for use as road material. Latrobe Construction Co. (Ligonier) reported output of crushed basalt for use as concrete aggregate and roadstone. Some of the stone was sold or used under contract to local and State government agencies. Lynn's Quarry (Smithton) yielded dimension miscellaneous stone for flagging stone. Westmoreland Clay Products Co. (Youngwood), producing miscellaneous clay, was the only active clay producer. Regional Refractories, Inc., leased a property near Derry but did not produce.

Wyoming.—Reduced demand for sand and gravel for highway construction was responsible for one-third less production in 1958, compared with 1957. Building and paving sand and gravel, engine sand, and fire sand and gravel were produced by Wyoming Sand & Stone Co. (Falls), East Falls Sand & Gravel Corp. (Falls), and Griffin Bros. (Tunkhannock). J. G. Robinson, Inc., produced and sold or used dimension sandstone (bluestone) as flagging stone.

York.—Medusa Portland Cement Co., York, produced Types I–II, waterproof white, gray portland, and "Brikset" and "Stoneset" mortar. Nine companies reported output of crushed limestone. The chief uses of the stone were for concrete aggregate, roadstone, blast-furnace and open-hearth flux, agricultural purposes, and cement and lime manufacture. Leading producers were Lincoln Stone, Inc., and Thomasville Stone & Lime Co. (both near Thomasville). Seventy-two percent of the stone produced was transported by trucks and 17 percent by railroad. The Funkhouser Mills, Division of the Ruberoid Co. (Delta), quarried, crushed, and ground slate at a local plant for use as natural granules and flour. Slate was exported to Canada and Venezuela. J. E. Baker Co. produced and sold dead-burned refractory dolomite from the York plant.

After a decline in 1957, the sand and gravel industry, comprised of Pennsylvania Supply Co. (York Haven) and Neuman Sand and Supply Co. (York), supplied paving sand and gravel, building sand, and sand for miscellaneous uses equal to the high demands made on the industry in 1956. Two divisions of Glen-Gery Shale Brick Corp. (Spring Garden and York Colonial) recovered miscellaneous clay for use at company plants to manufacture building brick. General Mining Association operated the Hokes mine 2 miles from Glenville to recover scrap mica. The mica was ground at the company local processing plant. Marlyn L. Fahs collected pyrite and limonite mineral specimens near York. The stone was kept as a collector's item and sold as gem material.

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